THE VETERINARY RECORD

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888

No. 16. APRIL 21, 1951 VOL. 63.

MASTITIS IN PRACTICE

I. Epizootiology and Bacteriology

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There is a mass of literature on mastitis, but, so far as we are aware, no description of all cases of mastitis seen by any one practitioner over a period of years, accompanied by bacteriological examinations. When this study was begun in 1945 we hoped that it would throw light on various aspects of mastitis that are not well understood. Ryle (1948) has explained how valuable such studies can be in elucidating the aetiology of disease and how they tend to be neglected in these days of "laboratory" research.

METHODS

A standard form for reporting was prepared and milk samples were taken before and after treatment from the great majority of cases seen in practice by one of us (J. B.) during 1945, 1946 and 1947.

Milk samples were examined by streaking 0·01 c.c. of milk on aesculin blood-agar plates. The milk samples were then incubated overnight and replated. Colonies were picked and identified by fermentation and serological tests. The following notation was used to record the number of colonies developing from milk samples:—

4 Numerous colonies
3 Moderate number colonies
2 Few colonies
} on plate inoculated with 0·01 c.c. of milk

1 Colonies on plate inoculated with the incubated sample of milk.

Simplified methods for bacteriological diagnosis have been described by Francis (1947). The changes of colour in incubated samples to which brom-cresol purple has been added are used to detect infected samples so that no bacteriological manipulations have to be carried out on uninfected samples and no medium is used. We now use the single medium described by Slavin (1948) for identifying streptococcal strains and it has given excellent results.

For the purposes of analysis the clinical symptoms were classified as follows:—

Changes in milk	Changes in udder	Systemic symptoms
3 Yellow serous blood stained, or foetid purulent material	3 Gross swelling with marked pain, oedema or discoloration, or gross induration	6 Gross constitutional disturbance
2 Clots or curds in watery discoloured milk	2 Swelling, moderate induration, or heat and pain	4 Temperature approximately 104°, severe anorexia, shivering
1 Trace of clots, or slightly watery milk	1 Slight swelling, or induration or increased heat	2 Slight temperature and slight anorexia

Each quarter was classified separately: the scoring for systemic symptoms was twice as high as for local symptoms, but if two or three quarters were affected in one cow the score for systemic symptoms was counted only once.

RESULTS

There were two people in the practice and the proportion of cases seen by J. B. is shown below:—

	J. B.	W. F. M.	Total
1945 ...	199 (150)	98 (17)	297
1946 ...	160 (71)	125 (16)	285
1947 ...	188	142	330

The figures in brackets show the number of cases dealt with under the Panel Scheme.

INCIDENCE OF MASTITIS

It will be seen from Table I that the 366 herds in the practice contained an average of 15 cows. The 83 herds visited by J. B. contained an average of 28·8 cows and over the three years an average of six cows per herd were treated. The 71 herds visited by W. F. M. contained an average of 17·3 cows per head and the 211 herds that were not visited for the treatment of mastitis (containing one-third of the cows in the district) contained on the average 8·4 cows each.

TABLE I

NUMBER OF HERDS AND COWS IN THE PRACTICE AND TREATED

	Number of herds	Number of cows	Average number of cows per herd
On register ...	366	5,409	14·8
*Visited by J. B. ...	83	2,397	28·8
*Treated by J. B.	83	518	6·2
*Visited by W. F. M.	71	1,227	17·3
Not visited ...	211	1,785	8·4

* This paper deals only with the herds visited by J. B.

These results show that mastitis is less common in small herds or that owners of small herds are less inclined to consult a veterinary surgeon, or both. In order to throw further light on this question the incidence of mastitis in the larger and smaller herds visited by J. B. was analysed as shown overleaf:—

Herds with over 30 cows				Herds with under 30 cows			
No. of herds	No. of cows	No. of cows with mastitis	% cows with mastitis	No. of herds	No. of cows	No. of cows with mastitis	% cows with mastitis
41	1,625	275	16·9	42	772	131	16·9

It will be seen that the incidence of mastitis was the same in the small and large herds, so the evidence is conflicting. Stableforth (1935) believed that the incidence was greater in large than in small herds, and this has been shown to be true of tuberculosis (Francis, 1947).

Breed Incidence.—A complete list of the herds, to which the cows mentioned in this paper belonged, was prepared. The number and breed of cows in these herds was known approximately. Where the breeds were mixed the numbers were divided proportionately.

A total population of 2,397 was estimated; 1,251 Shorthorns, 690 Ayrshires, and 456 Friesians; other breeds were not considered because of their rarity. These figures give ratios of 2·7, 1·5 and 1, whereas the ratios for all forms of mastitis in the three breeds were 2·5, 1·8 and 1, indicating that there is rather less mastitis in the Shorthorns and more in the Ayrshires, than in the Friesians, thus confirming the opinion of Arthur (1947). This result was especially due to the relatively high incidence of *Str. uberis* infection in Ayrshires, particularly those in lactation.

Relationship of Mastitis to Calving

No one bacterial type was specially associated with mastitis just after calving or at any other period of lactation. There were 133 quarters affected with mastitis during the first month after calving, but only 117 in the second to fifth months inclusive, and 53 in the sixth to eleventh months after calving. Both the clinical and bacteriological severities were slightly greater in the first month than in subsequent months. There were 374 quarters with some history of mastitis in dry cows and 181 of these were classified as "cases of mastitis." The average dry period is 73 days (Report, 1946-47), so 75 dry quarters were affected per calendar month of the dry period compared with a figure of 30 per month during the whole of the lactation.

Age of Cows Affected with Mastitis

The results are classified in Table II according to the number of calves the cows had had, and it will be seen that more than twice as many cows were infected with *Str. agalactiae* in each of the second, third and fourth lactations than in the first. When all other organisms were grouped together there was no important difference between the number of cows affected in the first, second, third and fourth lactations.

Table II

Incidence of Mastitis in Cows of Various Ages

	Lactating cows						Dry cows*						
Number of calves	1	2	3	4	5	6	0	1	2	3	4	5	6
Str. agalactiae	8	16	13	21	7	4	1	7	23	20	19	12	5
Mastitis associated with other organisms and sterile mastitis	52	36	47	35	12	11	2	26	45	30	33	10	5

* These figures include all isolations of organisms, *i.e.*, cows with no clinical disease.

No very firm conclusions can be drawn from the results in Table II unless one knows the proportion of cows of different ages in the population. An examination of a random sample of 67,611 lactations (Report, 1946-47) gave the following results:—

Percentage of	1st calvers		25·6
,,	2nd ,,		21·6
,,	3rd ,,		16·9
,,	4th ,,		13·8
,,	5th ,,		9·2
,,	6th ,,	and over	12·8

When these figures are divided into the total figures for mastitis in dry and lactating cows they give the results shown in Fig. 1. It will be seen that the incidence of mastitis associated with *Str. agalactiae* is more than four times greater in the fourth than in the first lactation, but in the sixth and subsequent lactations it is as low as in the first. Mastitis associated with other organisms is much more frequent during the first lactation than that associated with *Str. agalactiae*, but it is interesting that the curve follows the same trend.

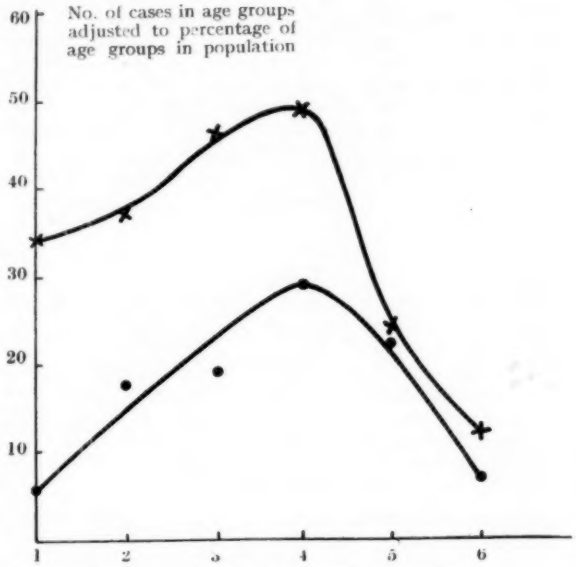

Fig. 1.—Incidence of mastitis in successive lactations.
Key: ● *Str. agalactiae.*
× Other forms of mastitis.

Murphy (1946 and 1947a) has reviewed the considerable body of evidence showing that the incidence of *Str. agalactiae* infection increases with age. He made observations for six lactations and did not observe a decreasing incidence after the fourth lactation. It is possible that our population was younger than in the survey published in the Report (1946-47), and the findings obviously require confirmation. Murphy (1946 and 1947a) suggests that the udder becomes more susceptible to *Str. agalactiae* infection with increasing age and Arthur (1947) also believes this to be true. All chronic infectious diseases are more frequent in old than in young animals, and the evidence that there is increased susceptibility to infection can hardly be accepted as convincing. Lancaster and Stuart (1951) found old cows more susceptible than young to experimental infection with *Str. agalactiae*. There was also great individual variation in susceptibility and one infection, far from producing immunity, increased susceptibility to subsequent infection. Murphy did not find that the incidence of staphylococcal

infection increased in the same way as infection with *Str. agalactiae*, which is not discordant with our results. "Sterile" mastitis was more common in the first than in subsequent lactations, perhaps indicating that much of it was "functional" in origin.

Association of Injury with Mastitis

A fairly careful examination was made for evidence of injury and it was observed in only 19 cases out of a total of some 300 cases in lactating cows. It will be seen from the analysis given below that three-quarters of the cases were infected with *Str. dysgalactiae*. Ferguson (1944) observed that the flora of injured was different from that of uninjured quarters. Thus, 57 per cent. of the pathogens

Str. agal-actiae	*Str. dys-galactiae*	*Str. uberis*	Unclassi-fied streptococci	"Sterile"	Total
2	12*	2	2	1	19

* One was infected with *Str. zooepidemicus*, in three the *end* of the teat was not injured.

isolated from "normal" quarters were *Str. agalactiae* and only 3 per cent. *Str. dysgalactiae*, whereas in injured quarters only 24 per cent. were *Str. agalactiae* and 23 per cent. *Str. dysgalactiae*. Of cases of acute and subacute mastitis in which injury was not observed *Str. dysgalactiae* was isolated from only 9 per cent. The well-recognised fact that outbreaks of mastitis associated with *Str. dysgalactiae* may be precipitated by too high a vacuum in the milking machine is of interest in relation to the foregoing facts, particularly as Espe and Cannon (1942) have shown that this may cause eversion and erosion of the teat sphincter.

Arthur (1947) recorded a high incidence of *Str. dysgalactiae* infection in quarters with injuries to the end of the teat. He also noted that *C. pyogenes* infection might become established following the original *Str. dysgalactiae* infection, and we have made the same observation in six lactating and two dry cows: only one of these quarters had been injured. It is probable that in the absence of treatment more dry quarters would have become infected with *C. pyogenes*.

In herds free from *Str. agalactiae* infection this organism was never isolated from injured quarters which, as Ferguson points out, supports the view that the udder is the sole reservoir of infection with *Str. agalactiae* but not of other mastitis organisms. Most of the injuries observed in our study were rather slight, although all but three involved the teat sphincter. The injuries described by Ferguson were probably more severe and caused chiefly by cows stepping on teats. It is of interest to note that during the winter of 1949 to 1950 probably more cases of injuries of this type were observed than in the whole period covered by this study.

It is held by many workers (see Ferguson, 1944) that injury is a major predisposing cause in mastitis and it is obvious that a severely damaged udder is prone to develop mastitis. Turnbull (1950) has presented evidence indicating that acute staphylococcal mastitis follows small injuries, but few such cases have been observed in this study, which does not indicate that injury is an important predisposing cause in mastitis, as it is encountered in practice. Murphy (1945) reached the same conclusion, and injury can have played little part in the experimental establishment of infection with *Str. agalactiae* by Lancaster and Stuart (1951). Little and Plastridge (1946) have rightly emphasised that infectious agents often cause mastitis in the absence of any injuries that can be detected.

Nevertheless, one cannot help being impressed by the fact that there is often a mastitis problem in those herds managed under "modern" conditions, where cleanliness, white tiles, and disinfectants are much in evidence, but where little attention is given to the handling of the udder, draughts, and chilling after washing the udder. In contrast, herds milked in almost filthy conditions without any regard to udder hygiene, but which are handled regularly by the owner or his family, are often free from a case of mastitis for several years. It cannot, of course, be disputed that once infection is established in a number of cows in a herd, lack of hygienic precautions will facilitate onset of further cases, and hygiene is an essential for clean milk production. The impression that technique is so important as a predisposing cause of mastitis is supported by the fact that, prior to the recent therapeutic aids to eradication, a mastitis problem in a given herd was frequently overcome merely by changing the cowman. Further, in a careful clinical study Kennedy (1943) found evidence of slight trauma and inflammation in a much higher proportion of cows that became infected with *Str. agalactiae*, in an infected herd, than in those that did not become infected. Some, at least, of this injury probably was due to the milking machine, and Watts (1942) showed that mastitis was more common in herds milked with one type of machine than with others.

In a number of cases encountered during this study there was strong evidence that draughts had been the predisposing cause for the onset of clinical mastitis.

Seasonal Incidence

In classifying the individual results a primary subdivision was made into lactating and dry cows. For the purpose of analysis the cases in dry cows were divided into (*a*) frank cases of mastitis which would lead the farmer to call in a veterinary surgeon, (*b*) cases that had had clots in the milk during lactation, (*c*) cases that had shown clots when going dry, and (*d*) quarters in which there was no history of mastitis, but which proved infected when sampled at the same time as a quarter or quarters with a history of mastitis. These last are only included in Tables IV and VI; they are included in Fig. 1.

It soon became apparent that there was a different seasonal incidence for different bacteriological types of mastitis and three main groups were differentiated:—

1. *Str. agalactiae*.—This is the most important single organism associated with mastitis and was dealt with separately.

2. Organisms associated with mastitis, chiefly in the summer.—*Str. dysgalactiae*, *C. pyogenes*, *Str. zooepidemicus*, and mastitis in dry cows from which no organisms were isolated ("sterile" mastitis).

3. Organisms associated with mastitis, chiefly in the winter.—*Str. uberis*, *Str. faecalis*, unclassified streptococci, staphylococci and mastitis in lactating cows from which no organisms were isolated ("sterile" mastitis).

The validity for this classification can be seen by an examination of Figs. 2 and 3.

Fig. 3 indicates that mastitis associated with *Str. agalactiae* infection in lactating cows is equally common at all times of the year, but the use of a quarterly basis masks the fact that only three cases of *Str. agalactiae* mastitis were seen in July compared with other monthly figures of seven to 15 and a monthly average of 9·5 cases. Mastitis of the "summer incidence" type was becoming more common in July, but in May and June only five cases of mastitis

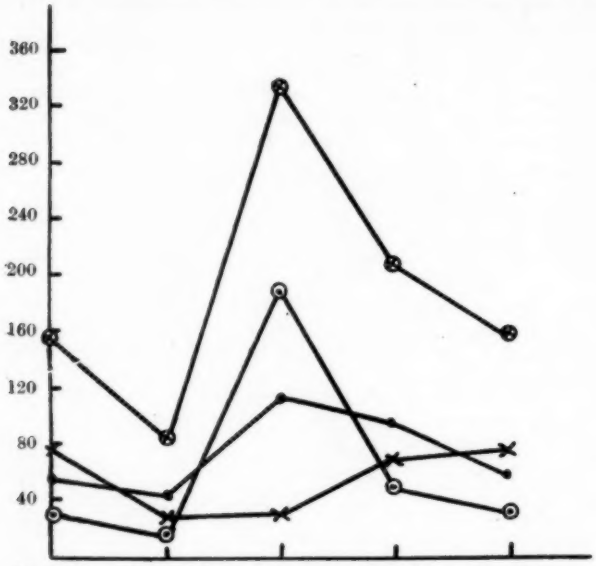

FIG. 2.—Seasonal incidence of bacterial types in all quarters examined in lactating and dry cows.

Key: ● *Str. agalactiae.* Group 1.
⊙ *Str. dysgalactiae, Str. zooepidemicus, C. pyogenes* and "sterile" mastitis (dry cows). Group 2.
× *Str. uberis, Str. faecalis,* unclassified streptococci, staphylococci, "sterile" mastitis (lactating cows). Group 3.
⊕ Total.

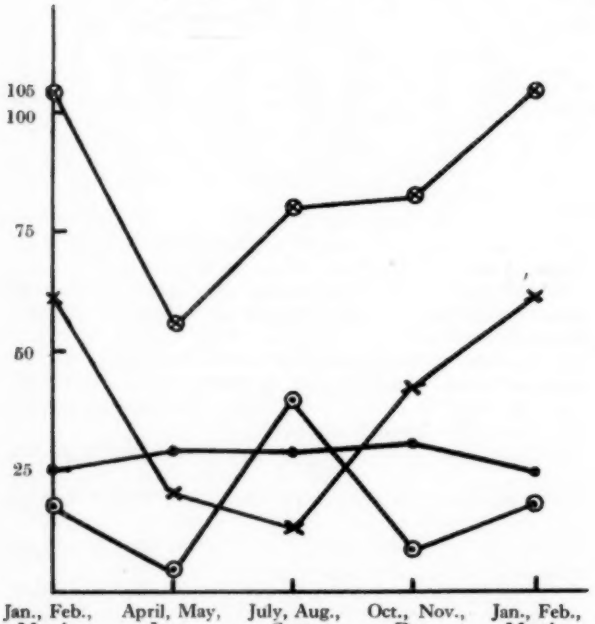

FIG. 3.—Seasonal incidence of bacterial types in quarters of lactating cows.

Key: ● *Str. agalactiae.* Group 1.
⊙ *Str. dysgalactiae, Str. zooepidemicus, C. pyogenes.* Group 2.
× *Str. uberis, Str. faecalis,* unclassified streptococci, staphylococci, "sterile" mastitis. Group 3.
⊕ Total.

were seen in lactating cows apart from the three cases of *Str. agalactiae* infection mentioned above and only three in dry cows; there were only nine cases of *Str. agalactiae* infection in dry cows in these two months. It will be seen that mastitis is much less common in May and June than at other times of the year, and this is confirmed by an examination of Fig. 2, although the figures are slightly raised by the inclusion of April in that quarter. The total incidence of mastitis in dry and lactating cows is much greater during July, August and September than at other times of the year. It may be felt that this result was unduly influenced by the fact that milk samples were taken from many cows that had shown previous evidence of mastitis at this period, but Fig. 5 shows that a very similar type of curve was obtained when the "cases of mastitis" in dry cows were graphed. Fig. 6 shows the seasonal incidence of cases of mastitis in lactating cows with systemic symptoms also follows the same trend as Fig. 3. Mastitis caused by *Str. dysgalactiae, Str. zooepidemicus,* and *C. pyogenes* had a very marked summer incidence (Fig. 2) and this was true in both lactating and dry cows (Figs. 3 and 4), despite the seasonal variations in numbers. In contrast, the other streptococci and staphylococci caused mastitis in both lactating and dry cows more commonly in the winter months. There are no difficulties about the foregoing classification, but it may seem wrong that "sterile" mastitis should have been included in Group 3 for lactating cows and Group 2 for dry cows. It is shown below, however, that much the same phenomenon occurs with *Str. agalactiae.*

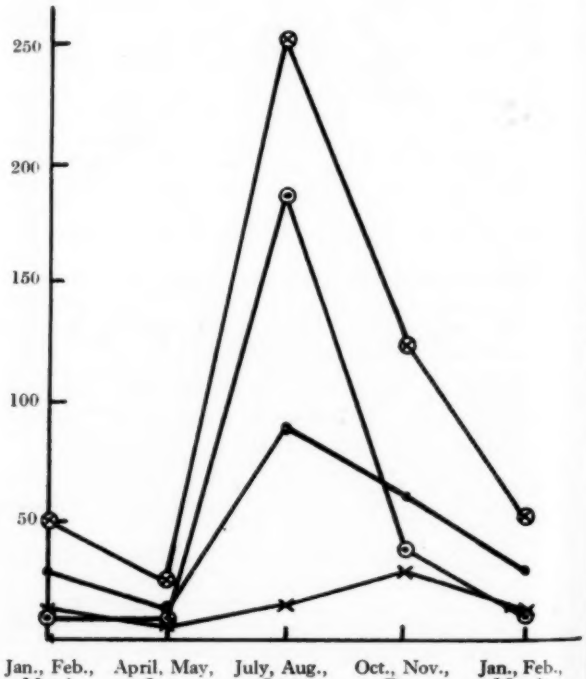

FIG. 4.—Seasonal incidence of bacterial types in quarters of dry cows excluding those with no history of mastitis.

Key: ● *Str. agalactiae.* Group 1.
⊙ *Str. dysgalactiae, Str. zooepidemicus, C. pyogenes,* "sterile" mastitis. Group 2.
× *Str. uberis,* staphylococci, *Str. faecalis,* unclassified streptococci Group 3.
⊕ Total.

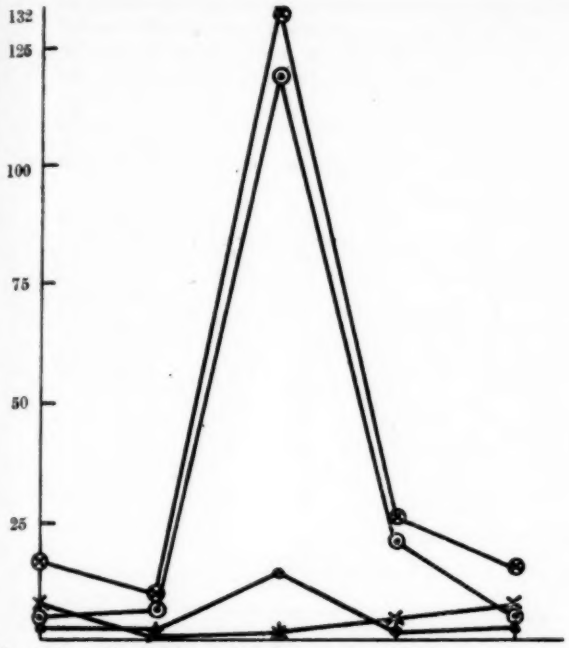

Fig. 5.—Seasonal incidence of bacterial types in " cases of mastitis " in dry cows.
Key: As in Fig. 3.

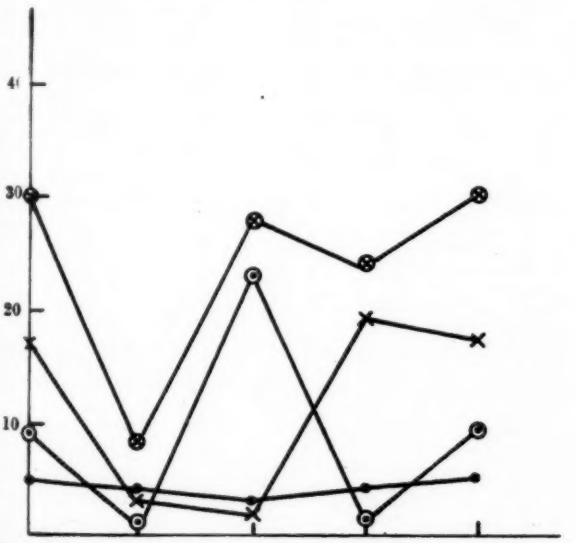

Fig. 6.—Seasonal incidence of bacterial types in cases of mastitis in lactating cows with systemic symptoms.
Key: As in Fig. 2.

There was no great difference in the average clinical severity or number of bacteria present at different times of the year. It will also be noted that " cases of mastitis " in dry cows gave the same shaped curves (Fig. 5) as did the total figures. This was equally true of the incidence in " lactating cows with systemic symptoms " and in all lactating cows (Figs. 3 and 6).

The only exception to the above statement is provided by Group 2 mastitis (page 285) in dry cows, which is more severe during July, August and September.

The observed seasonal trends discussed above could be due to a number of factors and particularly to a seasonal trend in calving. Obviously, in August and September there are many dry cows, so the total incidence of mastitis would tend to be low in lactating and high in dry cows at that time. The figures for the monthly sales of calves at the local market (Chelford), expressed as percentages of the total annual sales, are shown below:—

Average 1943–47							
Jan.	9·0	April	5·8	July	5·3	Oct.	13·5
Feb.	9·1	May	3·3	Aug.	7·3	Nov.	10·9
Mar.	11·2	June	2·9	Sept.	11·4	Dec.	9·9

They have been used to indicate the proportion of calvings at different times, and assuming a dry period of three months, the incidence per " 1,000 cow months " can be calculated, using the detailed evidence on which Tables II, IV and V are based. The results are shown in Table III, and it will be seen that the corrected incidence of *Str. agalactiae* (Group 1) mastitis still rises sharply in the third quarter in dry cows. It is evident from the corrected figures that the dry cow is much more susceptible to all forms of mastitis during the third quarter of the year than at other times. Despite this, the incidence of mastitis associated with Group 3 organisms is not high.

The corrected incidence of mastitis per " 1,000 cow months " in lactating cows varies less than that in dry cows. The highest incidence of Group 1 and 2 organisms in lactating cows is in August and September and of Group 3 organisms in January.

Table III
Seasonal Incidence of Mastitis in Cows per " 1,000 Cow Months "

	1st quarterly average	2nd quarterly average	3rd quarterly average	4th quarterly average
Monthly calvings in population of 2,397 (Table I)	235	97	192	275
All forms of mastitis:				
Cows calved 1 month	62·2	26·7	24·5	63·3
" 2-5 months	18·3	10·7	10·3	10·1
" over 5 months	6·4	4·2	10·0	4·3
All lactating cows	19·03	9·0	16·6	16·5
All dry cows	28·0	18·4	93·2	43·6
Group 1* mastitis:				
Cows calved 1 month	14·6	23·5	6·6	18·6
" 2-5 months	3·2	3·6	5·8	3·5
" over 5 months	2·4	2·2	5·0	1·8
All lactating cows	4·6	4·9	5·9	6·2
All dry cows	17·1	9·6	34·4	24·2
Group 2 mastitis:				
Cows calved 1 month	8·5		35·3	5·6
" 2-5 months	3·3	1·1	3·1	0·4
" over 5 months	1·4	0·6	3·5	1·3
All lactating cows	3·2	0·9	8·1	1·8
All dry cows	4·0	5·5	53·7	10·4
Group 3 mastitis:				
Cows calved 1 month	39·2	3·3	22·2	39·1
" 2-5 months	8·6	6·1	1·4	6·2
" over 5 months	2·6	2·0	1·5	1·2
All lactating cows	11·3	3·2	2·7	8·5
All dry cows	6·9	3·4	5·2	9·3

* For definition of groups, see page 285

Because mastitis was commoner in the first month of lactation than in later months the detailed information on the number of cases of mastitis in the first, second and third months, etc., after calving in each calendar month was analysed. Taking all forms of mastitis, the incidence per " 1,000 cow months " in cows calved one month during the two summer quarters is about 25 and the winter-quarters 62. In cows calved two to five months the incidence is 18 in the first quarter and ten in each of the other three quarters, but in cows calved for more than five months it is higher during the third quarter than the others, but the difference is not so great as in dry cows. It will be seen that there is a change from high winter susceptibility of newly calved cows, almost uniform susceptibility of cows calved two to five months, to a slightly higher susceptibility of cows calved more than five months and a very high susceptibility of dry cows during the third quarter of the year.

This changeover is particularly evident with Group 1 mastitis (*Str. agalactiae*), the incidence being strikingly lower in the third quarter in newly calved cows but not in cows calved for longer periods. With Group 2 mastitis the high summer incidence is maintained even in newly calved cows and the high winter incidence of Group 3 mastitis is evident in both dry and lactating cows. The different incidence of mastitis in dry and lactating (particularly freshly calved) cows is, therefore, chiefly due to the differential incidence of mastitis caused by *Str. agalactiae*: the fact that the incidence of " sterile " mastitis is high in dry cows in the summer and in lactating cows in the winter is mentioned elsewhere.

Many of the foregoing conclusions are based on rather small numbers of results and it is obviously desirable that further epizootiological examinations should be made to see if they are generally true. However, Ineson and Cunningham (1949) found that new infections with *Str. agalactiae* occurred most commonly during August, September and October.

General Clinical Features

The average number of quarters affected per lactating cow with *Str. agalactiae* was 1·54 and in dry cows 1·9 (Tables IV and V).

This is obviously a higher average number of affected quarters than is observed with any of the other organisms, all of which are recognised as causing "sporadic " mastitis, and supports the view that *Str. agalactiae* differs in being more infectious. It is very interesting to note, however, that in both dry and lactating cows the average number of quarters affected with " sterile " mastitis was about the same as with *Str. agalactiae*.

Str. zooepidemicus, *Str. dysgalactiae*, *C. pyogenes* and staphylococci usually caused the most severe mastitis, although *Str. faecalis* produced severe mastitis in lactating cows. Auld and Parker (1947) have described an outbreak of acute mastitis in which this organism was isolated from the milk. Table VI shows that it was with the first three organisms mentioned above that the highest percentages of systemic symptoms were associated.

The proportion of cases with systemic symptoms was similar in both dry and lactating cows (25 and 29 per cent. respectively), but this was due to the large number of cases in dry cows associated with *C. pyogenes*. If this infection is excluded there are still 28 per cent. of lactating cows with systemic symptoms but only 13·2 per cent. of dry cows. It may be mentioned here that not a single case of gangrenous mastitis was seen during the three years and Stableforth (1950) mentioned that for some unknown reason this condition had become much less common. Arthur (1947) observed only two cases in five years.

Table IV

Severity and Number of Various Forms of Mastitis in Lactating Cows

	Number of cows	Number of quarters	Average number of quarters per cow	Average clinical severity	Average bacteriological severity
Str. agalactiae	74	114	1·54	2·81	2·7
Str. dysgalactiae	39	48	1·2	4·16	2·8
Str. zooepidemicus	7	11	1·57	5·91	3·6
C. pyogenes	11	12	1·1	3·5	2·6
Total or average	57	71	1·25	4·17	2·8
Str. uberis	36	40	1·1	3·44	2·5
*Str. faecalis**	8	8	1·0	4·66	1·66
Unclassified streptococci	13	13	1·0	3·0	1·84
Staphylococci †	24	25	1·04	4·43	2·5
Sterile	35	53	1·5	3·7	
Total or average	116	139	1·2	3·63	2·45
Total or average, all types	247	324	1·31	3·6	2·5

* This organism was recognised by its action on the usual sugars, hippurite and litmus milk, and its reduction of 1/1,000 methylene-blue milk. Most strains also precipitated group D serum.

† Only those organisms producing the typical double zone of haemolysis are included.

In addition to the results shown in this table, five cases of acute coliform mastitis were seen but the detailed results were lost.

Table V

Severity and Number of Various Forms of Mastitis and Quarterly Incidence in Dry Cows

Organism	Number of cows	Number of quarters	Average number of quarters per cow	Average clinical severity	Average bacteriological severity
Str. agalactiae	90 (11)	172 (17)	1·9	1·85	2·8
Str. dysgalactiae	46	55 (11)	1·2	3·7	2·3
Str. zooepidemicus	4	4	1·0	4·25	4·0
C. pyogenes	40	46	1·15	6·63	3·1
Sterile	30 (20)	52 (34)	1·73	2·1	
Total or average	120 (20)	157 (45)	1·30	4·1	2·63
Str. uberis	19 (7)	27 (13)	1·4	2·2	1·7
Str. faecalis	5	6	1·2	2·0	1·1
Unclassified streptococci	3	4	1·33	1·75	2·0
Staphylococci	7	8	1·1	2·0	2·9
Total or average	34 (7)	45 (13)	1·32	2·34	1·9
Total, or average, all types	244 (38)	374 (75)	1·5	2·84	2·6
Total or average, all types. Dry and lactating	491 (38)	698 (75)	1·4	3·27	2·56

Figures in brackets apply to quarters that were sampled but in which there was no evidence of mastitis.

TABLE VI

THE PERCENTAGE OF COWS AFFECTED WITH MASTITIS SHOWING SYSTEMIC SYMPTOMS

Organism	Lactating cows			Dry cows		
	Total No.	Cows with systemic symptoms		Total No.	Cows with systemic symptoms	
		No.	%		No.	%
Str. agalactiae	74	10	13·5	90	2	2·2
Str. dysgalactiae	39	17	41·2	46	12	26·1
Str. zooepidemicus	7	6	85·7	4	1	25·0
C. pyogenes	11	6	85·7	40	34	85·0
Str. uberis	36	8	22·2	19	1	5·3
Str. faecalis	8	4	50·0	5	1	20·0
Other streptococci	13	3	23·0	3	3	100
Staphylococci	24	8	33·3	7	3	42·9
Sterile	35	10	28·6	30	4	10·3
Total	247	72	29·1	244	61	25
Total, omitting *C. pyogenes*	236	66	27·9	204	27	13·2

Those organisms causing the severest forms of mastitis were generally present in the largest numbers, but it should be noted that in both lactating and dry cows "sterile" mastitis was more severe than that associated with *Str. agalactiae*. It was also evident that there was little correlation between the numbers of any given organisms found in the secretion and the severity of the clinical symptoms. All cases of mastitis in lactating cows from which *Str. agalactiae* was isolated were classified according to the number of organisms present from "4 to 1" (Berger & Francis, 1951, Table 1), which represents a range certainly not less than 1,000,000 to 100 organisms per c.c. The 41 quarters with a bacteriological rating of 4 had a clinical score of 3·1 and the 23 with a bacteriological rating of 1 had a clinical score of 2·5, which is a very small difference. With "other forms" of mastitis the average clinical severity varied from 5 with the highest number of bacteria (57 quarters) to 3 with the smallest (36 quarters).

The main clinical features of mastitis have been described by Gould (1945) and it has been stated by some writers that a fairly reliable bacteriological diagnosis can be made from the clinical symptoms. It is not denied that there are clinical features characteristic of, say, acute *Staph. aureus* or *C. pyogenes* infections, but we have isolated *Str. uberis* or *Str. dysgalactiae* from the secretion of cases showing typical symptoms of acute staphylococcal infection. It is now well recognised that *Str. dysgalactiae* instead of *C. pyogenes* may be isolated from cases of "summer mastitis." We have also observed the typical picture of *Str. agalactiae* infection in a herd (Jessop), but only *Str. uberis* was isolated (Berger & Francis, 1950). It is also known that staphylococcal infections may give the same picture.

It has been claimed that the appearance of the secretion in the dry cow is a good guide to the presence of infection, but in our experience the character of the secretion is a very unreliable indication of infection when there is no palpable change in the quarter. We have found long, stringy curds or small clots present in a thin watery secretion which has proved quite sterile, whereas some secretions, although to the naked eye quite normal, proved heavily infected with mastitis organisms. Curds in the secretion of a cow which has been dry for a month or more appeared to occur most frequently when the drying off process had been sudden and initiated at a time when milk secretion was still fairly active.

THE TYPES OF BACTERIA ISOLATED

The number of times various organisms were isolated is shown in Table VII, together with the results of some other workers.

The first four columns show the results obtained in herd surveys in Great Britain and the U.S.A. *Str. agalactiae* was the organism most frequently isolated in three surveys (58, 57 and 59 per cent.), but only 38·5 per cent. of the bacteria isolated by Hughes (1948) were *Str. agalactiae* and 51·4 per cent. staphylococci. The frequency with which other organisms were isolated in the surveys varied, but *C. pyogenes* and coliform organisms were isolated very rarely.

In our work *Str. agalactiae* was isolated from 41 per cent. of the quarters affected with mastitis, which is comparable with the results of Ferguson (1944) and Stableforth (1950),

TABLE VII

PERCENTAGE OF VARIOUS ORGANISMS ISOLATED FROM "NORMAL" QUARTERS AND THOSE AFFECTED WITH MASTITIS

Types of infection	Herd surveys ("normal milk")					Samples from clinical cases of mastitis					
						This study					
	Ferguson (1944)	Andberg and Weirether (1944)	Hughes (1948)	Stableforth (1950)	Stableforth (1950)	Dry cows	Lactating cows	Total	Arthur (1947)	Ferguson (1944)	Roberts (1944)
Str. agalactiae	57·0	59·4	38·5	58·6	45·0	46·0	34·7	40·6	21·3	40·8	17·2
Other streptococci ...	13·0	19·3	10·1	23·4	15·0	25·7	36·4	30·6	30·0	27·4	34·1
Staphylococci	29·0	19·9	51·4	18·6	17·0	2·1	7·6	4·7	11·3	25·4	37·4
C. pyogenes	1·0	0·9			9·0	12·3	3·6	8·3	23·0	3·6	2·4
Coliform organisms ...	1·0	0·7				0	1·5	0·7		2·7	3·9
Sterile						13·9	16·4	14·6	14·5		6·4
Total number of samples on which percentages are based	498	443	235	48 herds	1,324	374	329	703	310	882	203

who obtained figures of 41 and 45 per cent. respectively in samples from clinical cases of mastitis. Roberts (1944) and Arthur (1947) obtained the much lower figures of 17 and 21 per cent. Arthur's results were obtained in four herds in which careful treatment of clinical cases had been carried out and it is known that this tends to reduce the incidence of *Str. agalactiae* infection. This fact is illustrated by an examination of our own results on an annual basis:—

Year	Per cent. of *Str. agalactiae* isolated
1945	46
1946	31
1947	38
1948	22
1949	22
1950	10

In 1948, 1949 and 1950, 187, 67 and 61 quarter samples were examined. All samples were not examined in these years and the results are not included in any other section of this paper. Samples were generally taken when there were several cases in a herd which would, if anything, increase the percentage of *Str. agalactiae* isolated. In fact, there was a striking reduction to 10 per cent. by 1950, which indicates that the use of sulphone and sulphone/penicillin (Berger & Francis, 1951) has greatly reduced the incidence of *Str. agalactiae* infection in the practice. Streptococci other than *Str. agalactiae* were isolated from 31 per cent. of quarters, which is about the same proportion obtained by other workers. Buxton (1948) believed that the occurrence of mastitis associated with *Str. zooepidemicus* was rare, but it will be seen that it was isolated from 2·1 per cent. of cases and that it caused acute mastitis. It should be mentioned that some of these strains could have been *Str. equi* (Hillermark, 1941) because their action on lactose and sorbitol was not tested. Staphylococci were isolated from only 4·7 per cent. of samples, which is a comparatively low figure.

C. pyogenes was isolated from 8·3 per cent. of quarters, which is similar to the results of Stableforth, much lower than those of Arthur and higher than those of the American workers. Edwards (1926) gave a good description of "summer" mastitis, and stated that he had observed it for 35 years in his practice. He noted that, although a large number of cows in one herd might be affected, it was not a highly infectious disease. He also noted that it occurred in cows in full milk as well as "dry cows" and non-parturient heifers. Jowett (1925) described mastitis associated with *C. pyogenes* infection as a disease occurring chiefly about three weeks after calving. In America the infection appears to occur chiefly in lactating cows and there is no marked seasonal incidence (Bean, Miller & Heishman, 1943).

It has often been stated that "summer" mastitis has a very high incidence and some surprise has been occasioned that the incidence was so low in recent trials (Stableforth, 1950). It will be seen that in the three years of this survey only 46 quarters of 40 dry cows were affected in a cow population of 2,397 (Table I). This was a very low figure, and although some cases of "summer" mastitis are excluded because bacteriological examination yielded *Str. dysgalactiae* or *Str. zooepidemicus*, it did not seriously affect the result. The year (1949) was a "moderately bad year" for "summer" mastitis and in all 64 cows were attended by J. B. and W. F. M. out of a cow population of about 3,500. This represents an incidence of 1·8 per cent. of all cows and perhaps 4 per cent. of cows that were dry during this period. It is obviously not possible to know how many cases occurred that were not seen, but the actual incidence was probably at least twice as high. Pearson (1950) recorded incidences of 5 to 10 per cent. in N. Ireland in 1947 and 1948, but apparently in some years a lower incidence has been observed. Weitz (1949) found 11·7 and 2·6 per cent. of cows affected in Anglesey in 1946 and 1947. Both sets of figures are the percentages of dry cows affected, so the incidence is of the same order as that observed by us in 1949.

During 1946 a record was kept to find the relationship between "summer" mastitis and the time of calving. The results are tabulated below and it will be seen that there was no increase of incidence just before calving.

Time before* calving in months ...	½	1	2	3	4	5	6	7
Number of cases observed	2	4	6	2	1	0	3	1

* Two additional cases occurred two weeks after calving.

Large numbers of *Bact. coli* were isolated from five quarters of lactating cows affected with acute mastitis. The udder was swollen and the secretion consisted of watery, straw-coloured fluid and there were acute systemic symptoms. Schalm (1949) has described latent, chronic and acute mastitis from which coliform organisms were isolated. In this study we have disregarded the presence of small numbers of coliform colonies on plates, but it appears that they may be of more significance than was generally assumed. Pneumococci (Wilson & Lancaster, 1949; McGaughey, 1949) were not isolated. Cases of tuberculous mastitis were, of course, encountered, but unfortunately no record was kept.

"Sterile" Mastitis

Quite apart from the lack of strong correlation between the numbers of organisms present and the severity of clinical symptoms mentioned earlier, there were 25 lactating quarters and 41 dry quarters from which no organisms were recovered. In the lactating cows the clinical symptoms in these cases were more severe than in any of the forms of mastitis associated with bacteria except *Str. zooepidemicus*. In addition, the results summarised in Table VIII show that in about one-third of all cases of mastitis in both dry and lactating cows bacteria were either not recovered at all, or were not recovered from 0·01 c.c. of milk (these results exclude *C. pyogenes* infection), *i.e.*, considering the low pathogenic power of the bacteria concerned they were present in such small numbers that it seems unlikely that they were directly responsible for all the symptoms observed.

Table VIII

The Association of Bacteria with Mastitis

	Total number of quarters affected with mastitis	Number in which bacteria were isolated by direct plating	Number in which bacteria were isolated by indirect plating	Number from which no recognised pathogens were isolated
Dry cows	296	183	72	41
Lactating cows	254	170	59	25

Failure to isolate pathogens from cases of mastitis is not generally recorded, but Arthur (1947) found that they were not isolated from 15 per cent. of affected quarters: a figure identical with that obtained by us. Some of the cases may have been infected with the anaerobic streptococcus mentioned by Stableforth (1950) and this is probable in some cases of "summer" mastitis as Gram-positive cocci were seen in smears but no organisms cultivated. It is very unlikely, however, that it was present in all cases. McFarlane and Rennie (1950) rightly emphasise that organisms may be causing damage in the udder tissue without appearing in the milk, but the work of McFarlane, Blackburn, Malcolm, and Wilson (1949) showed that there could be inflammation in the udder, as judged by high cell counts of the milk and pathological examination at *post-mortem* examination, although no pathogens were isolated from the milk or the udder tissue (anaerobic cultures were not made).

Baker and Little (1946) isolated a virus from a certain type of mastitis, but we have been unable to transmit the disease from two cases of "sterile" mastitis and similar negative results have been obtained by other workers (Stableforth, 1950).

The aetiology of "sterile" mastitis is uncertain, but it is very interesting that it is the only form of mastitis apart from that associated with *Str. agalactiae* in which over 1·5 quarters per cow were affected, and like *Str. agalactiae* mastitis it has a high summer incidence in dry cows and high winter incidence in lactating cows (if cows in late lactation are excluded). This need not necessarily imply that the condition is infectious: all organs are subject to functional disturbances and there is every reason to believe that the highly developed udder of the dairy cow is no exception. Any derangement of milk secretion that caused a blocking of the ducts could obviously cause swelling and clots in the milk, *i.e.*, "mastitis."

Predisposing Factors

It is generally agreed (Little & Plastridge, 1946) that predisposing factors are important in mastitis, but the exact rôle they play is uncertain. It has been shown in previous sections that mastitis was relatively more common in Ayrshire and Friesian cattle than in Shorthorns. Whether a wider survey would confirm these findings is not known, but there is evidence that there may be hereditary predisposition to mastitis (Little & Plastridge, 1946). Mastitis associated with *Str. agalactiae* is more common in old than in young cows (at least up to the fourth lactation), and Lancaster and Stuart (1951) have now shown that old cows are more susceptible than young. The incidence of mastitis associated with other organisms increases only slightly from the first to the fourth lactation. Gross injury obviously predisposes to mastitis, but this study shows that it is not an important factor as it is present in only a very small proportion of cases. There is some evidence that minor trauma to the teat and udder tissue may predispose to infection.

Murphy (1945) was unable to show that anatomical defects of the teat lining were related to the incidence of mastitis. Stuart and Lancaster (1949) found that cows which had been most susceptible to infection by external application of *Str. agalactiae* were most susceptible when infection was introduced into the teat canal. McEwen and Samuel (1946) showed that bacteria fairly easily entered the cow's teat during various milking processes. All these facts illustrate the importance of factors inside the udder which prevent the development of infection. Some evidence that minor injury to the udder may predispose to infection has been mentioned earlier, and various workers have produced evidence that inflammation reduces the antibacterial properties of milk, but McEwen and White (1950) were unable to confirm this finding, nor did they show that changes in feeding that occur at different times of the year affected the antibacterial action of milk, although it should be noted that their experiments did not extend into August and September. The antibacterial action did, however, decrease during the drying off period. Chambers (1920) found that fresh milk greatly inhibited the multiplication of *Bact. coli*, but not of *Str. lactis*, and we have found that *Str. agalactiae* and other mastitis streptococci grow more freely in fresh milk than does *Bact. coli*, which is not true in broth. Unlike some earlier workers (see McEwen & White, 1950) we were, however, unable to show that *Str. agalactiae* grew less well in fresh milk from quarters uninfected with *Str. agalactiae* than in milk from infected quarters. Lancaster (1950) obtained similar results.

The varying seasonal incidence of the different forms of mastitis shows that nutritional or climatic factors have important and differing influences on the different forms of mastitis. The total incidence of mastitis is highest during July, August and September. The fact that the lowest incidence was during April, May and June does not support the small amount of evidence presented by Murphy (1947b) that cows are liable to develop mastitis when turned out to grass. Again, the fact that the highest incidence was in July, August and September does not indicate that a return to the cowshed increases the incidence of mastitis. As mentioned earlier, mastitis caused by "Group 3" organisms (page 285) caused mastitis chiefly in the winter, but their total number was relatively small. The observation that mastitis in dry cows had a high peak in the third quarter of the year, but that the incidence in newly calved cows was lowest in this quarter is of considerable interest. This is particularly so as there appears to be a gradual changeover in susceptibility (from high winter to high summer) as lactation advances and the changeover is largely due to a change in the incidence of *Str. agalactiae* mastitis.

Francis (1941) suggested that an excess of oestrogens might predispose to mastitis. In support of this view it may be said that J. B. has observed that in certain cows clots usually appear in the milk at the onset of oestrus, and Kleckner (1940) has shown that only 4 per cent. of milk samples from cows not in oestrus had a *p*H of 6·9 or over, and in 80 it was 6·7 or less. At the height of oestrus 25 per cent. of samples had a *p*H of 6·9 or more and 39 per cent. of 6·8. Oestrogenic substances reach a high level in the last few months of pregnancy and McEwen and White (1950) showed that the antibacterial powers of milk declined during the drying off period. Further, Reece and Murphy (1943) found that the administration of diethylstilboestrol caused the milk of cows in advanced lactation to become macroscopically abnormal, and to resemble the secretion seen in chronic mastitis. We injected cow 28 that was seven months pregnant and giving 8 lb. of milk a day with 10 mg. of stilboestrol dipropionate on two successive days and with 20 mg. on the next day. The day after the final injection (fourth day) the milk yield had been reduced to 2 lb. and it contained small white clots. On the fifth day only 1 lb. of milk was obtained and it was thick and yellow and contained abundant curdy clots. On the ninth day the udder was slightly indurated. The average daily excretion of oestrus-producing hormone is 200 rat-units or less for the first 100 days of pregnancy,

1,000 during the next 100 days, and at parturition may rise to 6,000 rat-units, although it is more commonly about 3,000 (Turner *et al.*, 1930).

Our observations on epizootiology show that the monthly incidence of mastitis was four times greater during the first month after calving than in the four subsequent months. It may be felt that this is what one would expect on general grounds, but the high incidence in dry cows does not appear to be appreciated. As described in the section on the relationship of mastitis ot calving, 75 quarters were affected per month during the dry period compared with a monthly rate of 133 during the first month after calving and only 30 during the next four months. Neave *et al.* (1950) recorded 63 new infections during the lactation period of 89 cows, and 58 during the subsequent dry period, which gives a weekly incidence of 1·54 for the lactation and 4·14 for the dry period. When persisting infections only are considered the figures became 1·64 and 1·12 respectively. There were 19 clinical cases of mastitis during the dry period and 22 during the previous lactation. That is, the weekly rate during the dry period was 1·4 and during the lactation 0·5. As already stated, our monthly rate during the dry period was 75: during the whole of the lactation period it was 30, which gives a roughly similar ratio. When one takes into account the fact that mastitis is more likely to be overlooked during the dry than the lactating period it seems obvious that there are some factors that render the udder more likely to develop mastitis during the last few months of pregnancy, and the first month of lactation than at other times. The concentration of oestrogenic substances is high during the last part of pregnancy and reasons have been advanced to suggest that a high concentration of oestrogenic substances increases susceptibility to mastitis.

Summary and Discussion

During the three years, 1945 to 1947, 83 herds were visited by J. B. This represents about one-quarter of the herds in the practice and somewhat less than half the cows. Two-thirds of the herds containing one-third of the cows were not visited by anyone. During the three years nearly one-quarter of the cows in the 83 herds were treated for mastitis: the annual treatment rate was 7·2 per cent.

General clinical features were similar to those recorded by other workers. *Str. faecalis* produced quite severe mastitis in lactating cows. Staphylococci were not associated with very severe symptoms and no case of gangrenous mastitis was seen.

Str. agalactiae was isolated from 41 per cent. of quarters and other types of streptococci from 31 per cent., staphylococci from only 4·7 per cent., and *C. pyogenes* from 8·3 per cent. *Str. agalactiae* represented 46 per cent. of all isolation in 1946 but only 10 per cent. in 1950. (Some samples were examined during 1948, 1949 and 1950.) During the three years *C. pyogenes* was isolated from only 40 dry cows, *i.e.*, only 13 a year or about 0·6 per cent. of the cow population. This probably represents about 1 per cent. of dry cows during July, August and September. In 1949 the rate in dry cows was about 4 per cent. and this was considered to be a "moderately bad" year.

There was very little correlation between the numbers of any given organism found in the secretion and the severity of clinical symptoms. In both lactating and dry cows "sterile" mastitis was more severe than that associated with *Str. agalactiae*. In one-third of all cases of mastitis bacteria were not isolated from 0·01 c.c. of milk. The seasonal incidence of "sterile" mastitis was different in dry and lactating cows.

We have confirmed that mastitis associated with *Str. agalactiae* is more common in old than young cows; there was less difference in other forms of mastitis. There was an indication that mastitis was relatively more common in lactating Ayrshire cows than in Shorthorns or Friesians, but more data are obviously necessary before any conclusions can be reached about breed susceptibility.

There is very little evidence that anatomical differences in the teat or obvious injury are of much importance in most cases of mastitis. Gross injury is obviously important when it occurs and *Str. dysgalactiae* is much more frequently isolated from injured quarters than from any other clinical form of mastitis.

In both dry and lactating cows *Str. agalactiae*, *Str. dysgalactiae*, *Str. zooepidemicus* and *C. pyogenes* were isolated most frequently in the late summer. *Str. uberis*, *Str. faecalis*, unclassified streptococci and staphylococci were isolated most frequently during the winter months. There was a gradual changeover in susceptibility (from high winter to high summer) as lactation advanced. This different winter and summer incidence obviously requires confirmation on a wider scale and a mass of information on this subject must have been available for many years in the records of Veterinary Investigation Officers, but it has not been collated and published. The fact that the total incidence of mastitis was much greater during the third quarter of the year than in any other quarter shows that seasonal factors must exert an important influence, but it is difficult to know what these factors are, because this high incidence occurs when the cows have been out at grass all summer and before they are brought into the cowshed. It could be assumed that some insect vector was responsible and it has been shown that flies can transmit the infection, but this is probably not a common method of spread (Ewing, 1942). Biting flies may infect heifers (Sanders, 1944), but we do not believe that this entirely explains the high incidence of *C. pyogenes* infection in non-lactating animals during July, August and September. All forms of mastitis were much less common during May and June than in other months. The same observation has been made in 1948, 1949 and 1950 and had been made before this study was undertaken.

The high incidence of mastitis during the first month after calving, and the equally high incidence during the preceding three months of the dry period are striking observations: the incidence is four times greater during the first month after calving than it is, on the average, in the next four months. Various reasons are advanced for believing that oestrogenic substances may be partly responsible.

Acknowledgments.—We are indebted to Mr. R. Phillips for data about the sale of calves at Chelford, to Mr. J. Edwards, of the Milk Marketing Board, for supplying statistical data and to Dr. O. L. Davies for assistance with various calculations on seasonal incidence.

We are also indebted to Messrs. R. W. White and F. D. Vernon for their assistance with this work.

Note added in proof.—Cope, C. L. (1951, *Brit. med. J.*, **i.** 371) has shown that the levels of cortisone are raised during late pregnancy in man: it is well established that cortisone lowers resistance to a number of infectious diseases.

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WORLD BUTTER-FAT RECORD

The Scottish Farmer states that the British Friesian cow Zed Harlech Bunty R.M. has just completed an official 365-day lactation of 33,450¼ lb. milk at 5·03 per cent. butter-fat, which is equal to 1,682·5 lb. of butter-fat—a world record for fat production in 365 days.

"Bunty was born in April, 1941, and this was her sixth lactation. She had already in her third and fifth lactations completed yields in excess of 2,000 gallons. She is owned by Messrs. Drexler & Condliffe of the Zenda herd and was bred by Mr. Drexler when he was in a previous partnership. Her sire was Fintloch Pathfinder R.M. by the famous Terling Matrix R.M. and out of a cow by the equal'y famous Terling Conqueror R.M. Her dam was Hurdlesgrove Harlech Bunty, by Saracens Harlech. After she calved her sixth calf on March 11th, 1950, Bunty was milked three times daily but later was put on to four times a day milking at strict six-hour intervals, but apart from this she has received no special treatment, going out with the rest of the herd every day, summer and winter."

The previous world record for butter-fat production in one lactation was held by the British Friesian Craigbet Rosan with 1,632 lb. butter-fat from 35,231 lb. milk at 4·63 per cent.

CLINICAL COMMUNICATIONS

EXTERNAL APPLICATION OF TESTOSTERONE PROPIONATE AS NEO-HOMBREOL OINTMENT*

W. V. GRAY, M.R.C.V.S.,

Storrington, Sussex

Testosterone propionate is made up for use in the human subject as an ointment in two strengths, the weak containing 2 mg. per gramme, and the strong 25 mg. per gramme. In the female it is recommended that the ointment be applied to the vulva in such cases as frigidity and insufficient sexual desire.

Based on this information, it was decided to try the effect of the weak ointment in cases of anoestrus in animals, it being considered that the owner could apply the drug over a period and thus eliminate not only the probable absence of ovulation in the first oestrus induced by the administration of stilboestrol dipropionate but also the absence of a second normal oestrus three weeks after the first, which so often occurs to the inconvenience of the producer of milk or the owner of bitches; and also to render unnecessary the attempt to assess accurate dosage of other drugs or other forms of testosterone, which in point of fact is impossible.

The following notes are regrettably incomplete but serve to show the effectiveness of the preparation:—

(*a*) A brood mare of eighteen years. This animal—a mild nymphomaniac and thus infertile—was injected with 250 units of "Lutormone." The result of this was unknown for six months owing to the sudden illness of the owner, but after this time the condition was found at least not to have been permanent. A further 500 units of Lutormone were injected as it was necessary to obtain a quick result. The result was complete anoestrus. Half a tube of Neo-Hombreol, weak, was applied within the lips of the vulva and in the posterior vagina. Oestrus occurred in two days' time, eliminating the necessity for the owner to apply the second half as instructed on that day. Unfortunately it was decided not to breed from the mare again after all, and it must be admitted that there were signs of returning nymphomania.

(*b*) An Ayrshire cow, long infertile. Treatment was not considered complete, when the owner decided that he would like her served to be fit for the Dairy Show; she was at the time anoestrous. Half a tube of Neo-Hombreol was applied to the vagina and vulva twice, one day intervening. Oestrus occurred, but it was not unexpected that the cow did not conceive.

(*c*) Four anoestrous bitches, on the writer's instructions, have been the subjects of treatment by the owners with Neo-Hombreol. For fear of over-dosage "an inch as it comes out of the tube" was applied at three-day intervals, maximum three applications. Owing to the "delicacy of the situation" the ointment was applied to the skin of the perineal region. All four bitches came "into season" shortly. One, a boxer, was not served; the other three—two cocker spaniels and a bull terrier—were served, and each had six or seven pups.

. . . . . .

In the male human subject Neo-Hombreol ointment is recommended in cases of undescended testicles, lack of sexual development, etc.

* Organon Laboratories.

The writer was asked to attend an Alsatian dog of ten months of age. The testicles were found to be the size of hazel nuts, only partly descended and soft in consistency. The animal appeared to be undeveloped and had a general feminine appearance. The weak ointment was applied several times in the perineal region and the owner reported results in ten days. When next visited it appeared that the subject had been substituted, such was the change. The testicles were normal and he was of full male stature and development in every way. The bark also became stronger.

Conclusions.—In spite of the paucity of detail, it is clear that the use of testosterone as an ointment is successful in inducing oestrus in anoestrous female animals, in bitches being accompanied by ovulation; and that absorption through the skin as well as the mucous membranes occurs. More investigations in the large animals might be valuable. In one instance its use in the dog was successful in hastening retarded development.

* * * * *

PROLAPSE OF THE BLADDER IN SPANIEL BITCH

OLWEN D. JAMES, M.R.C.V.S.,

CARDIFF

Subject.—Springer Spaniel, f., eight months.

Clinical History.—Swelling of the vulva and a mucous vaginal discharge had been observed by the owner for six days, and was assumed to be the first oestrus.

A fluctuating swelling then appeared at the vulval orifice; it rapidly increased in size.

Clinical Examination.—The serous surface of the bladder was protruding from the vulva. It was easily emptied by gentle pressure, after which digital examination revealed a portion of the body of the bladder, contiguous with the neck, bulging through the urethral orifice.

Treatment.—Operative.

Technique.—After anaesthetisation by ethyl chloride a mid-line laparotomy was performed. The bladder, which showed a definite kink at the site of the prolapse, was straightened, and the middle ligament was transfixed by mattress sutures to the abdominal muscles on either side of the incision. The incision was closed in the usual manner. Two deep tension sutures were inserted. No. 2 20-day chromic gut was used throughout, except for the cutaneous sutures, which were of nylon.

Recovery was uneventful, and after a lapse of six months there is no sign of recurrence.

The only references to this condition that could be found were brief mention in Dollar's "Veterinary Surgery," and Hobday's "Surgical Diseases of the Dog."

ABSTRACTS

[The Early Diagnosis of a Free-martin. Goss, L. W. (1950.) *N. Amer. Vet.* **31.** 653–655.]

Casual examination is not always sufficient to reveal genital abnormalities in the free-martin calf. There is a type of free-martin whose external genitalia are apparently normal and which may easily be kept in the herd on the assumption that the calf is a true female. In these animals the parts of the reproductive tract of mesodermal origin are absent or rudimentary, *i.e.*, all the posterior third of the vagina which develops from the ectoderm. These animals readily can be detected by inserting into the vagina a glass rod $\frac{1}{2}$ inch to $\frac{3}{4}$ inch in diameter and 12 inches in length. If the heifer is normal the rod can be inserted until only about 2 inches of it protrude from the vulva, whereas if the calf is a free-martin the rod can be inserted only for a distance of about 3 inches.

A. T. C.

* * * * *

[Pig Feeding Trials with 2 : 3 : 5 : 6—Tetrachloronitrobenzene (TCNB). ABRAMS, J. T., SCORGIE, N. J., & WILLIS, G. A. (1950.) *Brit. vet. J.* **106.** 413–420.]

The chemical compound TCNB is used as an ingredient of "Fusarex" (Bayer), to control dry-rot disease of clamped potatoes, due to *Fusarium coeruleum*. Fusarex—a greyish-white odourless powder containing 3 per cent. by weight of TCNB in an inert powder base—also can retard or repress the sprout development of potatoes during storage without affecting the subsequent field growth. For use, 10 lb. of Fusarex to 1 ton of potatoes is recommended as a dusting powder before clamping.

Feeding experiments were carried out to ascertain if the feeding of pigs on Fusarex-treated potatoes had any deleterious effect. The pigs were divided into four groups of two animals each and were fed for 26 weeks from the age of from 18 to 20 weeks. A standard meal mixture with boiled potatoes was fed twice daily. Group 1 pigs received 60 mg. of TCNB per lb. of potatoes, Group 2 400 mg. per lb., Group 3 received untreated potatoes, and Group 4 600 mg. TCNB per lb. In the case of Group 4 the TCNB was added to the potato-meal mixture immediately before feeding.

After nine weeks' feeding the average weekly live weight of Group 4 was not as good as those of the other groups. Apart from a slight growth check during the early period of the experiment, there was little difference between the TCNB-fed pigs and the control pigs. Tests of the meat, fat, carcase and organs after slaughter confirmed that there is no ill-effect even when TCNB is used in the very high concentrations of this experiment.

D. J. A.

"BLOWING" OF CALF CARCASES

Ayr Corporation Markets and Slaughterhouse Committee recently resumed consideration of the question of the "blowing" of calf carcases, which was before the Council in June, 1948, and again in June, 1950. *The Meat Trades Journal* observes that the Superintendent reported that because of the by-law prohibition of the "blowing" of calf carcases in Ayr, many calves were being taken from Ayr market to Kilmarnock slaughterhouse where the "blowing" process is permitted, 17,000 calves having been removed since 1946. The carcases of "blown" veal are then send to England, and it is anticipated that the numbers of animals being dealt with in this way will increase in 1951. The loss of revenue to the Ayr slaughterhouse is very substantial.

WEEKLY WISDOM

In diagnosis, the young are positive and the middle-aged tentative; only the old have flair.—The Lancet ("Aphorism of the Week").

* * * * *

EXPERIMENTAL SLAUGHTERHOUSES

On April 10th Mr. Maurice Webb laid the foundation stone of a Ministry of Food experimental slaughterhouse at Guildford. The building will cost between £80,000 and £100,000. Another experimental slaughterhouse, at Fareham, is intended to serve Portsmouth and Southampton.

REVIEW

[Parasitology of Useful Animals for Veterinary Surgeons, Farmers and Keepers. Volume I. Protozoology and Entomology. (Trans. titles.) KOEGEL, A. (Vol. I with the collaboration of Hermann Bellew). vii + 339 pp. (183 figs., 103 refs.) Stuttgart: F. Enke Verlag. 1950. Price 30 DM. unbound; 32.70 DM. bound.]

This work is to consist of two volumes, of which this, the first, includes the sections on the Protozoa and Arthropods; the second volume on Helminthology is to follow. The book deals with the general principles of Parasitology within the first 24 pages and includes a short historical review, a brief discussion of the economics of parasitic infections, and some remarks on nomenclature. The sections on Protozoology (102 pages) and Entomology (200 pages) which follow are both arranged in similar fashion and deal with the general morphology and biology of unicellular and arthropod organisms respectively. Both sections are arranged systematically and include information on the classification, recognition, life-cycle, hosts, pathogenic importance and treatment of species or groups of parasites. The host animals include the usual farm livestock, poultry, fur-bearing animals, fish, bees, and silkworms, and although the majority of the parasites considered are those occurring in temperate climates, and in particular Germany, a number of tropical parasites and parasitic diseases of animals and humans are also described.

In his preface the author describes this manual as an "outline" suitable for veterinary surgeons, farmers and livestock breeders, but perhaps he has overlooked the fact that not all farmers and breeders are conversant with systematics and the latest zoological nomenclature. Admittedly, systematics demand a place in such a book, and in this volume they are richly and carefully set out; nevertheless, the inclusion of a host-parasite list, in the reviewer's opinion, would have increased its value greatly. It is, however, debatable if the subject matter will be wholly comprehensible to the farmer and stockbreeder, for "He that will write well in any tongue must follow this counsel of Aristotle, to speak as the common people do, to think as wise men do, and so should every man understand him, and the judgment of wise men allow him."

The binding, quality of the paper, printing and illustrations are all good, and the index is full and adequate. Unfortunately some misspellings in authors' and scientific names have escaped the proof-reader's notice, as have a few contradictions since, for example, on page 222 the reader is informed that the tarsi of the Trichodectidae end in two claws, whereas on page 224 he finds that they end in only one.

RETIREMENT OF CIVIL SERVANTS

The Treasury has put proposals to the Civil Service unions for the abolition of a "normal age of retirement" from the service. Generally speaking, the normal age has been 60, though for some years Civil Servants in certain circumstances have been encouraged to stay on beyond that age. The new proposals will change the position in that the age of 60 will be regarded as a minimum not a normal age of retirement, and retention will not be an exceptional measure to meet the manpower difficulties but the normal practice. A Civil Servant will still be entitled to retire at 60 or any time afterwards if he wishes to do so, and provision is made, where an officer is compulsorily retired, for him to be offered continued employment in a lower grade if he wishes. Pension arrangements will not be changed by the new proposals.

REPORT

THE MEAT PACKING INDUSTRY AND VETERINARY INSPECTION

In the autumn of 1948, on the initiative of the then Chancellor of the Exchequer, Sir Stafford Cripps, and of the Economic Co-operation Administrator in the United States, Mr. Paul Hoffman, the Anglo-American Council on Productivity was formed. The Council consists of representatives of Management and Labour in both countries, and its purpose is to promote economic well-being by an exchange of knowledge in the industrial realm. The chief means adopted to meet this end is to send industrial teams out to America to study methods of production, etc., and to adopt such ideas as are necessary to increase output and efficiency in British industry. Each team goes out as an independent body and, on its return, each is responsible for any report it issues.

In 1950 the Meat Packaging and Processing Industry in this country sent out a team of 18 representatives of the trade to study methods in the great U.S. Packing Industry. The British representatives were all engaged in the Meat Processing Industry, and were a cross-section of Management, Administrative, Scientific, Labour and Trade Union branches of the trade. The team returned last year, and they have now issued their report.*

The team spent six weeks in the United States, and travelled extensively, covering the famous packing houses of the country *en route*. Their report is addressed to the Food Manufacturers' Federation, the Sausage Manufacturers' Association, the National Union of Shop, Distributive and Allied Workers, the Transport and General Workers' Union, and the National Union of General and Municipal Workers. The team leader and Chairman was Lt.-Col. H. R. (Peter) Marsh, O.B.E., T.D., of Messrs. Marsh & Baxter, Ltd., and the Secretary was T. A. H. Sycamore, Esq., C.B.E., of the Food Manufacturers' Federation.

The report is primarily of interest to those engaged in the Industry, but as it contains numerous references to the Veterinary Inspection Service in the United States, and makes certain recommendations regarding such a service in this country, it is as well to quote in full what this team of non-veterinary people has to tell us. Before doing so, readers should be reminded that the N.V.M.A. devoted some time to discussing Veterinary Inspection in this Industry at the Bournemouth Congress in 1937, and it is refreshing to find a lay body not only endorsing, but, if anything, going further than the N.V.M.A. dared hope.

A whole chapter (Ch. 4) of the report is devoted to "Veterinary Inspection," and it is well worth quoting in full:—

"The Team found that in the U.S., meat inspection differed from the British practice in existing on two levels, 'Federal' and 'State.' If the food products are for export outside the particular State in which they are processed, the packers concerned must apply to the Meat Inspection Division of the U.S. Bureau of Animal Industry for an inspection service. This is known as 'Federal Inspection.' If the meat is for consumption only within the State, then the 'State' meat inspection service is considered sufficient.

* Productivity Team Report. "Meat Packaging and Processing." Report of a visit to the U.S.A. in 1950 of a Productivity Team representing the Meat Packaging and Processing Industry. Published by the Anglo-American Council on Productivity. U.K. Section, 21, Tothill Street, London, S.W.1. Price 4s.

" In either case the packer or processor must provide facilities for the inspection, office accommodation and janitor service. The cost of the meat inspection service is borne by the Federal Government or by the particular State in which the processing takes place. The only payment made by the owners of the plant is for any overtime inspection, *e.g.*, when the inspectors are expected to attend to their duties on Sundays or national holidays or in case of emergency. This, of course, compares more than favourably with the British practice, where the curer or packer, if he requires full veterinary inspection, usually has to bear the full cost of it in addition to providing accommodation, etc., for the inspectors. The Team visited only one plant working under State Inspection and because of this and of the variations existing between States it does not feel qualified to report upon this type of inspection. It is believed, further, that as much as 80 per cent. of the meat inspected in the U.S. comes under the Federal Inspection Service. This section therefore refers only to the ' Federal ' system. The Federally inspected American product competes in the world's markets at an initial advantage over the British product, in that it does not have to bear any direct heavy charge for the inspectorate. A further advantage, particularly for the export trade, is that this official examination is not only accepted nationally but is the basis of certificates for international trade. As a contrast, in the United Kingdom the packer wishing to export usually has to make special arrangements for the inspection, and meet the cost.

" The U.S. Bureau of Animal Industry is the responsible body for the Federal Meat Inspection Scheme, and is a Division of the U.S. Department of Agriculture, so that meat inspection in the plants is linked with the same department which controls all aspects of animal health and welfare; the advantages of such an arrangement are self-evident. The regulations governing ' Federal ' inspection as issued by this department are far more stringent and comprehensive and less inclined to allow loopholes than are the comparable British regulations. The American regulations go back to the year 1907 when a Federal Meat Inspection Service was set up. In Britain no Government-administered Meat Inspection Service exists even now, and the Public Health Acts of 1875, the Meat Regulations of 1924, the Food and Drugs Act, and numerous other Acts and Orders have never yet been properly co-ordinated and brought up to date. In Britain the Memorandum on Meat Inspection issued in 1922 is still a memorandum only, and has no force of law, so that uniformity in the practice of meat inspection hardly exists in Britain.

" The Team found the U.S. Regulations for meat inspection, as well as the inspection system in general, to be far ahead of anything in existence in Britain. The U.S. system covers the inspection of all food prepared from the usual food animals, and, in fact, also includes horses. The regulations are laid down to protect the consumer and prevent the spread of disease. The location of slaughtering plants, equipment, sanitary arrangements, construction and general layouts, are all subject to the approval of the U.S. Bureau of Animal Industry before any inspection can be allocated to the factory or slaughterhouse.

" The Team found that the inspector in charge of the meat inspection service at a plant carrying out slaughtering had to be a graduate of a veterinary college accredited to the U.S. Civil Service Commission. Under this officer are other veterinary officers and a staff of lay inspectors to assist them. In addition, laboratory technicians are employed for bacteriological and pathological examinations. Supervisory inspectors direct and instruct the plant inspectors. Travelling inspectors are also employed to inspect the various stations where the Bureau Meat Inspection Service operates.

" All factories and plants in which this meat inspection service operates can claim to have their products marked with a brand bearing the number allocated to the factory and the words ' U.S. inspected and passed.' Even products consumed within the individual States can have this guarantee in the form of what are called ' Domestic Meat Labels,' bearing the words ' Establishment No. ..... This meat or meat food product contained herein has been U.S. Inspected and passed by the Department of Agriculture.'

" The Meat Inspection Regulations of the U.S. are not only designed to prevent the spread of disease and the infection of the consumer from the diseases carried by meat but also to improve the quality and wholesomeness of the product. In food articles like sausage, even the percentage content of the cereal is distinctly laid down. The veterinary inspector not only has powers to condemn meat but also the right to inspect and sample any meat product made at the plant at any time, to determine if it agrees with the particular regulation laid down for that food item. Nothing like this service is in operation in Britain to-day, where the meat inspectors are all local authority inspectors with varying qualifications, training, and standards of inspection. As a result, it is only the larger plants which can finance their own inspection service through the local authority, and have veterinarians in the plant. Against this there are other plants, usually situated in rural or small urban areas, where offals and carcases are inspected by the plant personnel concerned and anything suspect is held pending notification to a local lay inspector; in some instances he is called in only as a last resource to issue the necessary condemnation certificates.

" In fairness the Team would say that, where qualified veterinarians are in control and conduct routine inspections of all carcases and offal, a very high hygienic standard is maintained. In certain plants such examinations exceed in their thoroughness and care of detail anything encountered in America. That such contrasts should exist would suggest that Britain is many years behind the U.S. in respect of the inspection of meat.

" The Team also feels that there is room for objection in those instances where not only does the local authority employ the inspectors, but also controls the municipal abattoirs in which that inspection is carried out.

Summary

" (1) The meat inspection service is either ' Federal ' or ' State.' It is provided for the packer free of cost, except for possible overtime payments and the provision of inspection facilities.

" (2) The Federal Inspection Regulations are most comprehensive and cover disease, cleanliness, water supply, drainage, equipment, layout and siting of the factory and the wholesomeness of its products.

" (3) Branding and labelling by Government Inspectors assist the packer in guaranteeing the wholesomeness of his products and protecting the consumer."

The report deals with various aspects of the Industry, and it is amazing to note that 20 years after its introduction into common use in Britain, the electric stunner is not used in the U.S. packing houses to this day! (In some plants about 8,000 pigs are killed daily. Each animal is hoisted by means of a chain shackled to the hind leg. As the " wheel " takes the pig's weight off the floor and one pig follows another in rapid succession, there is one long shriek lasting until the last of the 8,000 animals has bled

to death. Humane slaughtering methods seem to be comparatively unknown in the U.S.A. At least that is the impression one gets from reading between the lines in this report.) In a country noted for its technical efficiency this absence of modern stunning methods is the one reproach we can level at the U.S. packing industry.

Chapter 12 deals with "Recommendations," and we quote recommendations number 4, 5 and 6 here:—

"(4) Every effort should be made to encourage in this country the production of the long lean pig required by the industry.

"(5) A revision in the present system of meat inspection in Britain is necessary and important. Not only should standards of inspection be set up for the country as a whole, but there should be uniformity both in the methods and administration of such inspection. The United States Federal Service is well worthy of emulation.

"(6) Arrangements should be made whereby the viscera and the carcase of each animal should remain identifiable until inspection is complete."

There is no doubt that if this report is acted upon it will open out a new era in the packing industry and in meat inspection. It seems incredible that thousands of animals should pass through our packing plants in this country every day, many of them affected with some disease or other, with a very inadequate inspection service. In some cases the inspection such animals are submitted to may depend upon the whim of the factory manager. The N.V.M.A. has submitted its views on meat inspection to various official bodies from time to time, but so far the "reformers" have been kept at bay by apathy and ignorance. Here is a body of laymen from inside the meat industry itself recommending that the "United States Federal Meat Inspection Service is worthy of emulation."

D. J. A.

BRITISH HORSE SOCIETY'S PREPARATIONS FOR OLYMPIC GAMES

In the current issue of *The Horse and Pony News* it is reported that the Society's sub-committee have carried out their instructions to take immediate steps to prepare for the training of the Three Days Event team for the next Olympic Games. A full report of their detailed decisions has been approved by the Council, and briefly these are:—

(*a*) Training will be carried out at the Porlock Vale Riding School, and Captain Tony Collings has been appointed Manager and Trainer.

(*b*) From October 14th to November 10th, 1951, 16 selected horses will be concentrated at Porlock for trials.

(*c*) From October to April, 1952, six selected horses will remain in training, and from May 1st to July 31st, 1952, five "first" selected horses and five "second" selected horses will be in training.

(*d*) From May 1st, 1952, for 13 weeks, six riders will be in training.

The estimated cost of the training scheme will be £7,021, and it appears that a further £5,000 will be necessary to transport the full British team to Helsinki. It was estimated that the full team would consist of:—

Three riders and six horses for the Three Days Event.
Three riders and six horses for the Jumping Event.
Possibly one Dressage competitor.

It was hoped that the British Olympic Association might undertake this transport, but the Society must be prepared to do so.

In addition to the Training Programme outlined above, which will start in October, 1951, and end in July, 1952, there is a Supplementary Training Scheme—mainly intended to provide practical experience in competing under Three Day Event conditions. This latter scheme is already in operation through the generosity of certain owners who besides lending their horses are also paying a proportion of the necessary training fees, which will allow the Society to provide mounts for various selected riders not only at Badminton in April, but also in One Day Events in this country in the autumn as well as similar competitions on the Continent this summer.

Dangerous Drugs Regulations

(as amended up to December, 1950)

Summary of Veterinary Requirements

(Contributed)

Authority to Possess and Supply.—A person who is a registered veterinary surgeon or anyone registered in the Supplementary Veterinary Register under the Veterinary Surgeons Act, 1948, is authorised to possess and supply any of the controlled drugs and preparations so far as is necessary for the practice of his profession.

Obtaining Supplies Personally.—The authority to possess and supply enables the practitioner to procure such material as is necessary for his practice and supplies may be obtained from the local pharmacist by personal purchase, when the entries made by the pharmacist in the Poisons Register must be signed by the practitioner.

Obtaining Supplies by Written Order.—When a personal visit to the supplier is impracticable a written order may be sent by hand or by post to the local pharmacist or usual wholesaler supplier. The order must state the name, address and profession of the purchaser; the purpose for which the drug is required, *e.g.*, "for use in my practice," and give the total quantity to be purchased. If the product is in the form of ampoules, which normally contain an average of 10 per cent. in excess of the stated dose or quantity, it is sufficient if the order states the total amount to be administered or injected. The order must be signed personally.

Emergency Supplies.—In an emergency drugs may be obtained before the supplier receives the signed order provided that an undertaking is given to furnish the order within the following 24 hours.

Messenger Deliveries.—If a messenger is sent to collect an order for dangerous drugs he must be provided with a letter of authority signed by the purchaser stating that he is authorised to collect the goods on behalf of the practitioner.

Supplying the Drugs:

Personal Administration.—A record must be kept, in the manner set out below, of any drug or preparation administered to an animal either personally or by some person under the supervision of the practitioner.

Dispensing.—Any medicines made up and supplied in the course of veterinary practice for use or administration by some other person must be labelled with the name and address of the supplier in addition to any directions for use, and an entry must be made in a book regularly used for the purpose, stating date, name and quantity of ingredients and name of the person supplied. The entries must be made on the same day or at latest the day following. Any medicine not for internal administration must be labelled "For external use only" if supplied in a bottle.

Prescribing.—Prescriptions can only be given "for animal treatment only" and must be marked with the words quoted. A prescription must (*a*) be in writing; (*b*) be dated and signed by the prescriber (initials are not sufficient); (*c*) give name and address of person to whom the prescribed article is to be delivered and (*d*) state the total amount of a B.P. or B.P.C. preparation or, in any other case, the total amount of the dangerous drug to be supplied.

Repetition of prescriptions is not permitted unless a specific statement is made on the prescription indicating the interval which must elapse before a second or third supply is made. Not more than two repeats may be made without the issue of a new prescription. In any case the prescription must be retained by the supplier after the initial supply has been made.

Records.—A register of purchases and issues must be kept with a separate section for each drug. A bound book is essential. Card index and loose leaf books are not permitted. Transactions must be entered as they occur or within 24 hours after occurrence. Entries must not be altered in any way, but should a correction be necessary it is made by means of a dated marginal or footnote.

For purchases enter date of receipt, name and address of supplier, amount and form obtained.

For issues make similar entries for all drugs or preparations administered or dispensed.

Storage.—Except when required by the necessities of professional requirements all drugs must be kept in a locked receptacle which can be opened only by a registered surgeon or practitioner.

QUESTIONS IN PARLIAMENT

Self-Suppliers' Pigs (Inspection)

Dr. Stross (April 9th) asked the Minister of Food (1) whether he will instruct local food offices to supply the public health departments in their areas with details of applications to slaughter pigs which have been reared under the self-suppliers of pigs scheme;

(2) whether he is aware that under the self-suppliers of pigs scheme pigs are slaughtered at irregular times and on private premises, and that the carcases cannot be inspected and examined for possible disease by the local authorities; and whether he will consider amending the Food and Drugs Act, 1938, so as to allow for such inspection.

Mr. F. Willey: I think we should reserve the question of amendments to the Act for consideration in the light of the Report of the Interdepartmental Committee on Meat Inspection, which will be published shortly.

The present position is that authorised officers of local authorities have power to examine the carcase of any pig which is to be sold in whole or in part for human consumption. They have no power, except at the request of the owner, to examine a pig which is not intended for sale. We would not be justified therefore in requiring food offices to notify public health departments of applications made solely for food control purposes. Self-suppliers would be wise, in their own interests, to arrange for inspection at the time of slaughter whether by a private veterinary surgeon or by an official where the local authority is able to provide the necessary service.

. . .

Agenised Flour

Mr. Touche (April 9th) asked the Minister of Food whether his attention has been called to the statements made at an inquest at Hull recently regarding the effects of the agenisation of flour; and whether he will make a statement on the subject.

Mr. F. Willey: I am aware that certain allegations were made which were controverted by expert evidence at the inquest. Recently, a scientific committee reviewed the subject of flour improvers but was unable to find any evidence that agenised flour is in any way toxic to man.

Mr. Redmayne asked the Minister of Food in what degree agene-nitrogen trichloride gas is still being used as an improver of flour.

Mr. F. Willey: Exact information is not available, but it is probable that about 90 per cent. of flour used for human consumption is at present treated with nitrogen trichloride.

Lieut.-Colonel Bromley-Davenport asked the Minister of Food what steps have been taken by his Department to give effect to the recommendation of the Joint Committee of the Ministries of Health and Food to the effect that agenised bread should be discontinued; and how many cases of poisoning of human beings through this process have been reported during the last 12 months.

Mr. F. Willey: Agreement has been reached with the milling industry to stop the use of agene and the choice of an alternative improver is under consideration with them. No case of poisoning of human beings through this process has been reported to the Registrar-General during the past 12 months.

Sir W. Smithers asked the Minister of Food if he has considered details, which have been sent to him, about the harmful results of the use of agenised flour; and if he will make a statement.

Mr. Webb: I would refer the hon. Member to the reply, given to-day to the hon. Member for Dorking (Mr. Touche).

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Deer (Killing and Wounding) Scotland

Mr. Henderson Stewart (April 10th) asked the Secretary of State for Scotland if he is aware of the depredations during the past winter of gangs of unauthorised men armed with rifles who fire at night-time upon herds of deer from cars whose headlights illuminate and dazzle the animals; that considerable numbers of deer are thus wounded and die on the hillside; that doubt exists as to whether either the rifles or the lorries and cars used are licensed; what reports he has had on the matter from the police; and what action he proposes to take.

The Secretary of State for Scotland (Mr. McNeil): Police reports which I have obtained from the Highland areas show that in some places there is some killing and wounding of deer in the manner described by the hon. Member, but information as to the numbers killed or wounded is not available.

Mr. Stewart: Is the right hon. Gentleman aware of the considerable anxiety on the part of public opinion in Scotland about this? Is there not a case for an enquiry into this somewhat revolting form of commercial poaching?

Mr. McNeil: As the hon. Gentleman knows, a Committee is enquiring just now into cruelty to wild animals. This is part of their remit, and their Report is expected shortly.

Mr. John MacLeod: Is the right hon. Gentleman aware that very often on these expeditions sheep are killed or wounded, and that this causes a great deal of worry in the Highland areas?

Mr. McNeil: I am aware of that, and the police are similarly aware of it. The police use mobile forces to try to cope with it.

Captain Duncan: Will the right hon. Gentleman make enquiries of local owners of deer forests and from the police force to find out exactly what has happened? Damage and cruelty are not confined merely to the Highland areas but are far more widespread.

Mr. McNeil: As I have already indicated, I have called for the fullest reports from the police. While I do not want to minimise the distressing extent of this practice, it is possible to exaggerate it.

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Horses (Slaughter)

Mr. Peter Freeman (April 12th) asked the Minister of Agriculture if, in view of the growing shortage of horses and the large number now being slaughtered for human consumption, he will arrange for all horses to be licensed or registered after reaching the age of one year and prevent any being so destroyed without his authority.

Mr. T. Williams: No. I do not consider that control of the slaughter of horses, such as my hon. Friend suggests, is either necessary or desirable.

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Slaughterhouses

Mr. Peter Freeman (April 11th) asked the Minister of Food what has been done to secure a general improvement in the conditions of slaughterhouses which were described as unsatisfactory in the recent Report of the Departmental Committee on Export and Slaughter of Animals; how soon the findings of this Committee as to central control and supervision will be carried out; and whether it is his intention to provide slaughterhouses for horses killed for human consumption.

Mr. Webb: These aspects of the Report of the Departmental Committee on the Export and Slaughter of Horses are being examined, in relation to slaughterhouse policy generally, but I cannot make any statement at present.

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Nigerian Livestock Commission (Report)

Mr. Hurd (April 11th) asked the Secretary of State for the Colonies if he has considered the recommendations made by the Nigerian Livestock Mission; and if he will make a statement.

Mr. J. Griffiths: The report of the Mission is at present under detailed examination by the Nigerian Government, and I am not yet in a position to make any statement on it.

Mr. Hurd: Will there be consultation with the people of Nigeria, as well as the Government of Nigeria, so as to ensure that the policy decided upon carries popular support?

Mr. Griffiths: It is under examination by the Nigerian Government and what steps they take and whom they consult is a matter for them. I am certain that they will take all steps which they think are necessary

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Gambia (Poultry Scheme)

Mr. Hurd (April 11th) asked the Secretary of State for the Colonies if a decision has now been reached on the future of the Colonial Development Corporation's poultry farming project in the Gambia.

Mr. J. Griffiths: No, Sir. The Corporation's review of the project is not yet sufficiently advanced for them to be able to inform me of their proposals.

Mr. Hurd: Can the Minister say when he hopes to make a statement, as there is great public anxiety about this matter?

Mr. Griffiths: No, I shall make a statement as soon as I receive the proposals from the Corporation.

B.P. ADDENDUM, 1951

The British Pharmacopoeia Commission have produced under the direction of the General Medical Council an Addendum to the British Pharmacopoeia, 1948. It was published on April 19th, and will become official on September 1st, 1951. The Addendum contains 114 pages, with 18 pages of introduction, and the price is 17s. 6d. (postage 6d.). The publishers are Constable & Co., or copies can be obtained through the Pharmaceutical Press, 17, Bloomsbury Square, London, W.C.1, in which case a remittance should be sent with the order.

NOTES AND NEWS

Diary of Events

Apr. 25th.—Annual General Meeting of the Association of Veterinary Teachers and Research Workers (Scottish Regional Group) in the Glasgow University Veterinary School, 2.30 p.m.

Apr. 26th.—Meeting of the West of Scotland Division, N.V.M.A., Clinical Club in the University of Glasgow Veterinary School, 7.30 p.m.

Apr. 27th.—Annual General Meeting of the Sussex Division, N.V.M.A., at Brighton (The Old Ship Hotel), 2.30 p.m.

Apr. 27th.—Meeting of the Yorkshire Division, N.V.M.A., at Leeds (Great Northern Hotel), 2.30 p.m.

Apr. 28th.—Annual General Meeting of the Association of State Veterinary Officers, at the Royal Veterinary College, London, N.W.1, 2 p.m.; Annual Dinner, at the Criterion Restaurant, Piccadilly, 6.30 p.m.

May 1st.—Meeting of the Midland Counties Division, N.V.M.A., at Birmingham (The Medical Institute, 154, Great Charles Street), 2.30 p.m.

May 5th.—Meeting of the Biochemical Society, in the Department of Biochemistry, University of Oxford, South Parks Road, Oxford, 11 a.m.

May 10th.—Annual General Meeting of the Southern Counties Division, N.V.M.A., at Winchester (Royal Hotel, Peter Street), 6 p.m.

May 23rd.—Meeting of the Technical Development Committee, N.V.M.A., at 36, Gordon Square, London, W.C.1, 10.30 a.m.

Sept. 23rd-29th.—Sixty-ninth Annual General Meeting and Congress of the National Veterinary Medical Association, at Eastbourne.

R.C.V.S. Examinations

Wednesday, May 2nd.—Animal Management Examination commences at London.

Thursday, May 10th.—Entries for D.V.S.M. Examination due.

Tuesday, May 15th.—Pharmacology, etc., Examination (Revised Syllabus). Written Examination.

Thursday, May 17th.—Pharmacology, etc., Examination (Revised Syllabus). Orals and Practicals (London and Dublin).

Thursday, June 7th.—D.V.S.M. Written Examinations commence at Edinburgh.

Monday, June 11th.—D.V.S.M. Oral Examinations commence.

Thursday, June 21st.—M.R.C.V.S. Written Examinations.

Friday, June 22nd.—M.R.C.V.S. Written Examinations.

QUARTERLY MEETINGS OF COUNCIL AND STANDING COMMITTEES N.V.M.A. DURING 1951

The following dates are given for remaining meetings this year, chiefly to give members plenty of time to reserve hotel accommodation.

In Edinburgh

Wednesday, July 11th:

11 a.m. Home Appointments Committee.

2 p.m Organising Committee.

4 p.m. Parliamentary and Public Relations Committee.

Thursday, July 12th:

11 a.m. Veterinary State Medicine Committee.

2 p.m. General Purposes and Finance Committee.

Friday, July 13th:

11 a.m. Council.

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The California State Veterinary Medical Association will hold their 63rd Annual June Convention, June 25th, 26th and 27th, at the Mar Monte Hotel, Santa Barbara. Those interested should contact Charles S. Travers, Executive Secretary, 3004—16th St., Rm. 208, San Francisco 3, California, for information.

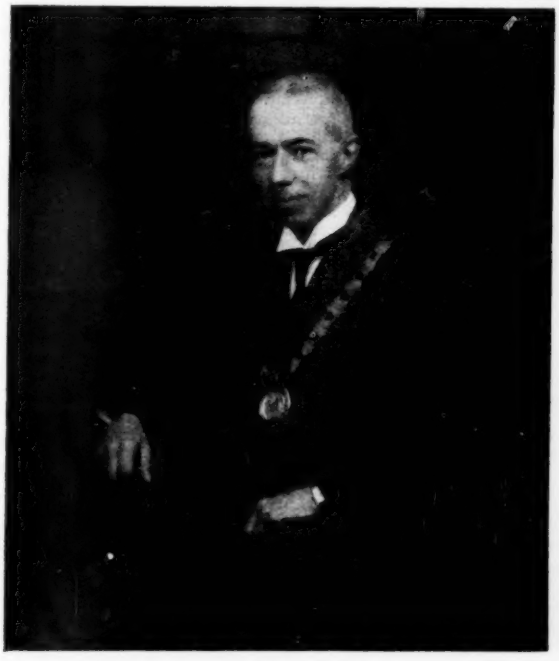
PERSONAL

Mr. G. P. MALE'S Retirement from Council R.C.V.S.

Plea for Practitioner Participation

A very graceful and happy method of marking his retirement from the Council of the Royal College of Veterinary Surgeons—an event which, after his 32 years of devoted and loyal service, is a matter of supreme regret to his colleagues—was appreciatively experienced by the Councillors in their capacity as the guests of Mr. George P. Male at an informal luncheon party held at the Holborn Restaurant, London, on Thursday of last week.

Following an excellent repast, the Host and Chairman, Mr. Male, gave "The Royal College of Veterinary Surgeons," wishing it ever-increasing prosperity and intimating that this would be the only



President, R.C.V.S., 1931 32.

toast of the occasion. Very properly ignoring the injunction, however, Sir Thomas Dalling said that, as President of the Royal College, he would ask the company to drink the health of Mr. Male, now retiring after 32 years' service as a member of the Council. In all probability he would take the opportunity, in another place, to refer to this deeply regretted retirement, but it would be very remiss of him if, as President, he omitted to call upon them for that tribute and also to thank him, on their behalf, for his hospitality on that occasion. They were indeed sorry to lose Mr. Male, who, however, himself felt that the time had arrived, and had chosen that fraternal method of signalising his retirement. All of them wished him well. (Cheers.)

Mr. Male, who was accorded an ovation and received with musical honours on rising to reply, said that, despite the President's failure to observe his orders as Chairman (laughter) he would be most ungrateful if he did not thank him most sincerely for the very kind way in which he had proposed the toast and the company had responded.

It had been a great wrench to sever his connection with the Royal College. He had had a very happy time there and he had enjoyed every minute of it: his heart and soul was in the profession and he was very sorry to leave his old friends and colleagues, but he thought it was time someone younger took his place.

He had seen a great many changes on the Council. When he joined it they had some very notable people and others of like calibre had followed in their footsteps: indeed, they had some distinguished newcomers and he was very glad to welcome the representatives of the Privy Council, the Universities and other bodies: he was sure they would be a great asset to the Royal College. (Hear, hear.) At the same

time, he did hope that the practitioners would take time to become members of Council. (Cheers.) After all, it was to the practitioner that the public looked to help it out with trouble with its animals, and the public would sink or swim according to the ability, honesty and integrity of the work done by the practitioner. So when they were nicely tucked up in their warm beds of a night, let them just give one thought to their unfortunate brother practitioner—scouring the countryside and helping to alleviate the suffering of animals. (Hear, hear.)

He was delighted to see his old friends and colleagues that day. He thanked them very much for coming and giving him that farewell "round the table." He would conclude by wishing success to the Royal College of Veterinary Surgeons: might it go on and prosper—he was sure he was leaving it in very good hands.

He would like to thank Mr. Oates for so kindly making the arrangements for that little function: it had been a very great help.

Dr. J. T. Edwards: He could not feel content to leave the matter just there, for he wished to remind them that Sir John M'Fadyean thought so highly of Mr. Male that he invited him to become his very first assistant. If Mr. Male had accepted he would surely have become Sir John's successor. Despite the fact that Mr. Male shared to the full the enthusiasm for horse practice common to the young graduate of his time, he decided that what he wanted was a knowledge of cattle practice: therefore, could Sir John recommend him to a really first-class cattle practitioner? Without any hesitation Sir John recommended him to Mr. Richard Hughes, of Oswestry, whose recent passing was so deeply mourned by them all. Mr. Hughes received not only Mr. Male, but also their distinguished Past-President Mr. Dawes, teaching them in masterly fashion that consummate art which was country practice. 'Do what you will to support the profession in the way of politics, administration and those who call themselves anything but veterinary surgeons—(laughter)—you will always have the country practitioner as the backbone to keep you on the 'straight and narrow,'" that was what Mr. Male had done, and what now they could clearly perceive—therefore he thought they owed him their deepest gratitude. (Cheers.)

Mr. H. J. Dawes: At a time such as that it would be fitting for him to add a few words of praise and acknowledgment to their host. He spoke for the whole body of old-standing practitioners in this country in expressing their thanks to Mr. Male—in a personal manner, because not only was Mr. Male one of the leading practitioners of this country but one of the small band of equine consultants, and as one who on many occasions had to thank him for his advice and help, he would like to express his own indebtedness and that of those who also had experience of Mr. Male's kindness in that capacity.

He had in the past come to regard Mr. Male not only as one of the senior practitioners but as a valued friend and on behalf of those people who had benefited from their host's advice and assistance in consultation, he desired to add his tribute of thanks to him that day. It was as a general practitioner that they would always think of him, and although he was relinquishing his connection with the Council of the Royal College, he (Mr. Dawes) hoped they would still be able to turn to him in that very happy association of friend and adviser on the problems of veterinary practice.

Some of those present had been unfortunate, because they had never had the pleasant opportunity of meeting Mr. Male as consultant, over a valuable horse. He was always *au fait* with oneself, with the patient and with the owner, and he could not imagine anything more desirable in a consultant than the ability to pass those three tests so triumphantly. Therefore on behalf of all those who had benefited from Mr. Male's assistance on so many occasions, he thanked him from his heart. (Cheers.)

Professor G. H. Wooldridge: He, too, wished to say something from the personal angle. During the whole of the long time he had known Mr. Male they had been the most intimate friends and he hoped that would continue for many years to come. (Hear, hear.) When the outbreak of war necessitated his departure from London to Reading, he merely had to indicate to Mr. Male that he had to come to that part of the world, for Mr. Male to put himself about to find him accommodation. Apart from that, however, during his stay at Reading he had a more intimate association with him than at other times, and he could not emphasise too much the very delightful companionship they then enjoyed.

Percy Male was one of the most helpful, charming friends he had ever had, and in the Council of the Royal College he would miss him at his right hand very considerably. He could not speak too highly of their personal relationship during all those years, and so far as the Council was concerned, he was indeed sorry that Mr. Male was leaving them: but he spoke not only for himself but for every member of Council when he expressed the assurance that their personal relationships would always be the same: the element of friendship would never fade. He thanked him again for the long-continued faithful service he had given them and only regretted that Mr. Male felt at last that the time had come when he must relinquish his work on the Council. (Cheers.)

Dr. W. R. Wooldridge fittingly terminated the tributes paid on so convivial an occasion by some happily phrased references to his experiences as one of Mr. Male's clinical assistants, leaving open the question as to whether or not these were mutually advantageous!

Mr. Male then drew matters to a close in the manner proper to a Chairman: "This is all highly irregular"—laughter—adding in moving tones: "I do thank you from the bottom of my heart for all the nice things you have said."

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Mr. Harry Cooper.—We extend warm congratulations, on behalf of the profession, to Mr. Harry Cooper, M.R.C.V.S., of King's Mill Lane, Huddersfield, who celebrated his 95th birthday on April 4th, and are glad to have the evidence of his continued health and vigour afforded by the fact that he was at work as usual on that day.

Mr. Cooper, who graduated at North Edinburgh in 1881, has won many horse-racing trophies and his services have been in great demand as a judge at shows.

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Birth.—Gates.—On April 8th, 1951, at Enugu, Nigeria, to Charlotte, wife of G. M. Gates of the Colonial Veterinary Service, a daughter, Veronica Ann.

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Forthcoming Marriage.—Briggs—Theobald.—Mr. and Mrs. G. A. Briggs, of Easby Drive, Ilkley, have pleasure in announcing the engagement of their elder daughter, Ninetta Mary Briggs, B.V.Sc., M.R.C.V.S., to Leslie Theobald, B.V.Sc., M.R.C.V.S., younger son of Mr. and Mrs. Charles Theobald, of Richard Kelly Drive, Liverpool.

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Marriages.—Gracey-Hall.—On April 4th, 1951, at St. John's Parish Church, Hilltown, Co. Down, by the Rev. J. Caldwell, B.A., Joseph Forde, M.R.C.V.S., D.V.S.M., son of Mr. and Mrs. G. H. Gracey, Brookvale House, Rathfriland, to Kathleen Rozamund, youngest daughter of Mr. Robert Hall and the late Mrs. Hall, Hilltown, Co. Down.

Owen—Lewis.—On March 31st, 1951, at St. Ffraid's Church, Llandyssul, Desmond Corbet Owen, M.C., M.R.C.V.S., to Mary Lona Lewis.

Williams—Potter.—On March 8th, 1951, quietly at All Saints Church, North Moreton, Didcot, Berks, Gareth Williams, B.Sc., M.R.C.V.S., to Enid Ruth Potter, of North Moreton, Didcot.

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R.C.V.S. OBITUARY

Trotter, Alexander M., Gladney, Ceres, Fife. Graduated Edinburgh May 26th, 1893. Died April 7th, 1951; aged 81 years.

The Late Mr. Alexander M. Trotter, M.R.C.V.S.

Mr. Alexander Mackay Trotter, whose death we record above with deep regret, was formerly veterinary surgeon and inspector to Glasgow Corporation. He retired in 1934 after 37 years' service with the corporation, during which period he devoted himself whole-heartedly to pioneer work in the field of bovine tuberculosis eradication. Fuller tribute will be paid in an early issue.

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VICTORIA VETERINARY BENEVOLENT FUND

"In Memory of Mrs. Mary King"

Second List

The Secretary gratefully acknowledges the receipt of donations from the following:—

Mr. G. N. Bushman, Mr. & Mrs. Hardy and Sheila and Edward, Mrs. Lily G. James, Mrs. M. L. Mills, "XYLOL."

Total received to date, April 17th, 1951, £33 16s.

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GENERAL OBITUARY

Sir Thomas Baxter

The considerable number of our readers who, having had contact with Sir Thomas Baxter, admired him both for his personal qualities and for his sterling work to promote the interests of the

milk-producing section of the agricultural industry, will have learned with deep regret of his death, which took place on Saturday last at Sutton Coldfield, Birmingham, at the age of 73 years.

Himself devoting his life to dairy farming, Sir Thomas Baxter was elected President of the National Farmers' Union in 1927, and six years later he was appointed the first Chairman of the Milk Marketing Board, a post which he held until his retirement in 1949. He was knighted in 1943.

In recognition of his outstanding service to agriculture and in particular to milk producers, especially during his 16 years as Chairman of the Milk Marketing Board, the National Farmers' Union raised a veterinary research fund. In connection with the fund they set up a fellowship under the Animal Health Trust for the purpose of long-term research designed to reduce disease among dairy herds.

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Election of P. J. du Toit, B.A., Ph.D., Dr. Vet. Med., D.Sc., F.R.S. (S.A.), to Fellowship of the Royal Society of London

Veterinarians all over the world would be gratified to notice Press announcements of the recent election of Dr. P. J. du Toit as Fellow of the Royal Society and will welcome this brief reminder of his career. He is the first veterinarian to receive this particular honour although not the first to deserve it.

Pietrus Johannes du Toit was born at Somerset Strand, Cape Province, in 1888. His father, D. F. du Toit, was owner and editor of *Di Patriot*, a paper which did much for the cultural development of the Afrikaans language, and this perhaps accounts for his strong love for his mother tongue, although his scientific reputation has been built up through the medium of other languages.

Taking first place on the matriculation list at the age of 16 he graduated B.A. with honours in Zoology from Victoria College, Stellenbosch, in 1907, as best pupil of Dr. Broom, the well-known South African palaeontologist. In 1908 he proceeded to Europe on the Queen Victoria Scholarship, and after studying in Halle and Berlin graduated Ph.D. in 1912 with high honours from the University of Zurich. On returning to South Africa he came under the influence of Sir Arnold Theiler, then Director of Veterinary Research at Onderstepoort, who advised him that a brilliant career lay open to him in the application of protozoology to tropical diseases of animals. Acting on this advice he returned to Germany and took the veterinary "Staatsexamen" in 1915, and the degree of Dr. Vet. Med. of Berlin University in 1916 with a thesis on "Lukaemia in cattle." Caught by the war, he was interned in Germany, but as a Dutch South African was allowed to complete his studies, and to collaborate with Professor Knuth in the revision of Mense's "Handbuch der Tropenkrankheiten."

After the war he married an Englishwoman and returned to South Africa in 1919. He was immediately taken up by Theiler, who, with characteristic foresight, recognised this brilliant mind and energetic spirit as the logical future bearer of the torch he himself had lighted in the land. With the founding of a Faculty of Veterinary Science in the Transvaal University College in Pretoria in 1920, and its affiliation with the Veterinary Research Laboratory at Onderstepoort, du Toit became Professor of Infectious Diseases in the former and Deputy Director of the latter.

On retiral of Sir Arnold Theiler in 1927 he succeeded as Director and as Dean of the Faculty. The field and research services of the Department of Agriculture were amalgamated soon after, and du Toit became "Director of Veterinary Services and Animal Industry" for the Union of South Africa.

He had a natural gift for seizing the essentials of a situation, dealing with it and dismissing it until it arose again (what has been called the "forensic habit of mind"), and this, combined with clarity in public speaking in both official languages, rapidly brought him into prominence in University affairs. He was elected Chairman of Senate for the University of South Africa for the years 1924-26 and subsequently became a member of several University Commissions, including one which reported upon the creation of a Medical Faculty in the University of Pretoria.

As delegate for the Union of South Africa he attended innumerable overseas congresses and conferences, including the International Veterinary Congress in London in 1930, in New York in 1934 and in Zurich in 1938; the Imperial Agricultural Bureaux Conference in London in 1927, the Empire Scientific Conference in 1946, and two conferences of the Food and Agriculture Organisation. He was Chairman of one of the Committees of the World Food Conference at Copenhagen in 1946, and there are few organisations relating to problems of Animal Health in which he has not played a prominent part.

He was President of Section M of the British Association for the Advancement of Science at Bristol in 1930, and President of the South African Association at Durban in 1932. In 1934 he received the Gold Medal and grant of that body, the highest scientific honour South Africa has to bestow. He had already received the Senior Scott Medal of the Biological Society of South Africa in 1929, for "Research in South Africa." He has long been a Fellow and Council Member of the Royal Society of South Africa, is a membre correspondante de l'Academie Vétérinaire de France et de la Societie de Pathologie Exotique, Paris. For his services to the University of South Africa he was awarded an honorary D.Sc.

The list of his scientific publications, research and general, either alone or in collaboration with others, is a formidable one. It exceeds 250 items and is characterised by an extraordinary range of subject matter.

Before his retiral from the Directorship of Veterinary Services in 1948 du Toit was honorary Deputy Chairman of the South African Council for Scientific and Industrial Research. He is now official head of that organisation and wields great influence in scientific and educational affairs. In this connection it is of interest to recall that Clunies Ross, head of the Australian C.S.I.R.O., is also a veterinarian.

du Toit can be relied upon to add lustre to the Royal Society of London which has now honoured him.

H. H. Green.

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LEGAL NOTES

Dog Chasing Chickens: Circumstances Justifying Shooting

In the King's Bench Division of the High Court, on April 5th, the appeal was allowed of Mr. Francis Frederick Goodway, by case stated, against the decision of Chippenham (Wiltshire) justices, sitting at Corsham, who had convicted him on an information preferred by the respondent, Sir William Wrixen Becher, under Section 41 of the Malicious Damage Act, 1861, charging the appellant with unlawfully and maliciously shooting and killing a dog.

The appellant was a farmer who, on August 30th, 1950, shot a dog which was chasing his poultry.

The material facts appear from the judgment (states this *Times* Law Report).

The justices held that the appellant had had the fixed intention of shooting the dog; that he might have taken other steps, such as that provided by Section 2 of the Dogs Act, 1871; and that he did not exhaust every practicable means of stopping the dog from attacking the fowls. They accordingly convicted the appellant and fined him £2.

Judgment

The Lord Chief Justice, in giving judgment, said that the justices had approached the matter from the wrong point of view. The appellant and his brother owned some 85 acres of land adjoining the property of the respondent, Sir William Becher. The appellant was a farmer. The respondent's stepson owned a bitch which was a confirmed poultry chaser. On three successive days the dog had chased the appellant's poultry. The appellant had informed the respondent, and said that, if he found the dog chasing his hens again, he would shoot it. The next day the dog was again chasing the hens.

His Lordship said that great damage was suffered by farmers through dogs. No branch of the law required more urgent amendment than that relating to animals. No action for trespass would lie; one could, however, protect one's property against animals. Here was a confirmed worrier. Warnings did no good. The appellant and his brother went to the field, where they saw the dog come from a fowl-house. They tried to drive it into a fowl-house in order to catch it, but failed. The dog went on chasing fowls, and the appellant shot it. The justices had found that there were other steps which he could have taken, such as going to a Court of summary jurisdiction to obtain an order that the dog should be kept under control. They had found that the appellant did not exhaust every practicable means of stopping the dog from attacking fowls. He (his Lordship) thought that the justices had come to a wrong conclusion in law. The question was not whether the appellant had taken all possible steps, but whether he had acted reasonably. The law had been correctly stated by Lord Justice Scott in Cresswell v. Sirl (63 *The Times* L.R. 620; [1948] 1 K.B. 241). In his (Lord Goddard's) opinion the appellant had acted reasonably, and the appeal would be allowed.

Mr. Justice Oliver, agreeing, commented on the justices' finding that the appellant had set out with the fixed intention of killing the dog. He (his Lordship) took them to mean that the appellant intended to shoot the dog if he again found it chasing fowls. There was nothing illegal in what the appellant had done.

Mr. Justice Cassels agreed that the appeal should be allowed. It appeared that the dog was gun-shy. He (his Lordship) could not say that the farmer was wrong because, while his fowls were being worried, he did not wait to observe the effect on the dog of a gun-shot into the air.

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

SWINE FEVER:

Anglesey.—Penlan Farm, Llangefni (Apr. 14th).

Cumberland.—Middletown Farm, Middletown, Egremont (Apr. 14th).

Durham.—Low Stresholme, Snipe Lane, Darlington (Apr. 13th).

Isle of Ely.—Robb's Chase, Outwell, Wisbech (Apr. 9th); Goose Tree Farm, Rings End, Guyhirn, Wisbech; The Paddock, George Street, Wisbech (Apr. 10th).

Lancs.—Warren Farm, Southport Road, Formby (Apr. 11th).

Midlothian.—West Edge Farm, Gilmerton, Edinburgh (Apr. 12th).

Norfolk.—Spread Eagle Inn, Erpingham, Norwich (Apr. 12th).

Notts.—Forest Farm, Farnsfield, Newark (Apr. 9th); Brecks Lane, Ordsall, Retford (Apr. 12th).

Stirling.—No. 1 Holding, Longcroft, Denny (Apr. 11th).

Yorks (E.R.).—"Roseville," Middleton-on-the-Wolds; Corporation Farm, Weel, Beverley (Apr. 9th); Tank Farm, Swan Land (Apr. 10th).

Yorks (W.R.).—Charity Gardens Allotments, Goole; Grange Farm, Rossington; Estate House, Main Street, Sprotborough, Doncaster (Apr. 9th).

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RECONSTITUTION OF THE DOMESTIC POULTRY KEEPERS' COUNCIL

In its Report published in May last, the Committee on the Organisation of Domestic Food Producers under the chairmanship of Mr. George Brown, M.P., Joint Parliamentary Secretary to the Ministry of Agriculture and Fisheries, recommended that a national independent organisation should be established for domestic poultry and rabbit keepers, and that the Domestic Poultry Keepers' Council should be invited to promote such an Organisation. The Minister of Agriculture and Fisheries accepted these recommendations and has reconstituted the Domestic Poultry Keepers' Council under the chairmanship of Lord Macpherson to guide and assist domestic poultry keeping and to promote the formation of an independent organisation of domestic poultry keepers with a democratically elected Governing Body.

The composition of the reconstituted Council is as follows:—Lord Macpherson (Chairman), Mr. R. Bolton, Mr. J. Bulman, Mr. H. Collinson, Mr. H. Cooke, Mr. W. D. Evans, Mrs. F. C. Jenkins, C.B.E., Mr. W. Powell-Owen and Mr. Gordon Saunders.

Mr. A. J. Edney, of the Ministry of Agriculture and Fisheries, has been appointed Secretary of the Council and communications should be addressed to the Secretary, Domestic Poultry Keepers' Council, Ministry of Agriculture and Fisheries, 28/32, Chester Terrace, London, N.W.1.

The British Rabbit Council has agreed to look after the interests of domestic rabbit keepers and is forming a special sub-committee for this purpose and also to encourage the keeping of rabbits for meat. A representative of the British Rabbit Council has been nominated to the National Council for Domestic Food Production.

As part of the measures being taken to keep Government expenditure to the lowest possible level, it has with reluctance been decided to close down within the next two months the present Area Organisation of the Domestic Poultry Keepers' Council and to dispense with the service of the staffs of the area offices. In this connection, the Ministry of Agriculture announcement adds: "The contribution of the domestic poultry keepers to the nation's food resources is fully recognised. It is hoped that it will be possible to keep in being a nucleus of the existing organisation, especially the voluntary sub-area organisers, in order that the work may continue without a break pending the setting up of the new organisation. It is hoped and expected that the democratically elected body which will be promoted by the new Council will meet all the needs of domestic poultry keepers and enable them to continue to play their part in meeting the nation's food requirements."

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SOCIETY FOR ENDOCRINOLOGY

At the annual general meeting of the Society for Endocrinology on Thursday, April 12th, 1951 the following officers and committee of the Society were elected:

Chairman of Society: S. J. Folley.
Hon. Secretaries: C. H. Gray and N. F. Maclagen.
Hon. Treasurer: F. L. Warren.
Hon. Editor of Society's Proceedings: P. L. Krohn.
Ordinary Members of Committee. E. C. Amoroso, G. W. Harris, C. J. O. R. Morris and E. F. Scowen.

At the annual general meeting of the *Journal of Endocrinology* Ltd., the following Officers and Council were elected:

Chairman: S. J. Folley.
Secretary: C. H. Gray.
Treasurer: F. L. Warren.
Other Members of Council: E. C. Amoroso, G. W. Harris, P. L. Krohn, N. F. Maclagan, C. J. O. R. Morris and E. F. Scowen.
Editor: S. Zuckerman.
Assistant Editor: P. L. Krohn.
Editorial Board: A. C. Crooke. S. J. Folley, G. F. Marrian and I. W. Rowlands.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

THE DISCOVERY OF THE TICK TRANSMISSION OF TEXAS FEVER IN CATTLE

Sir,—In a letter which I have just received from our highly distinguished colleague, Dr. D. M. Campbell, D.V.S., late Editor of *Veterinary Medicine* and joint author, with Dr. L. A. Merillat, of "Veterinary Military History of the United States," he tells me after expressing appreciation of the series of articles, "Veterinary Medicine during the Past Fifty Years" which appeared in *The Veterinary Record* last January that at the time the above textbook was written, from which I had drawn my information upon the facts relating to the discovery of the tick transmission of Texas fever, he had not read the statement made by Dr. D. E. Salmon at the annual meeting, on September 3rd to 6th, 1901, of the American Veterinary Medical Association held at Atlantic City, New Jersey.

The statement, a copy of which Dr. Campbell has kindly forwarded to me, reads as follows:—

In a discussion of tick fever at the Atlantic City Meeting of the A.V.M.A. in 1901 Dr. D. E. Salmon, Chief of the Bureau of Animal Industry, U.S., said:

"The credit for discovering that Texas fever is transmitted by ticks has been given most of all to Dr. Theobald Smith, and secondly to Dr. F. L. Kilborne. I know all the facts, and want to say that Dr. Smith does not deserve any credit for that part of the investigation. Previous to the time the experiments were made, Dr. Smith discovered the pyrosoma in the blood, and deserves credit for that; but the fact that he discovered the pathogenic organism in the blood had a tendency to convince him that the ticks had nothing to do with the disease, and he was unwilling to spend his time in experiments whether the ticks had anything to do with it or not. I was convinced from the coincidence of the quarantine district and the home of the tick that there was some connection between them. We had gone over the whole south, mapping out the Texas fever district. We found the infected district coincided with the habitat of the *Boophilus bovine*, and I was impressed with the coincidence to such an extent that I believed it was worth while to make some experiments to bring out the facts. I thought the coincidence was such that it should be investigated, and called Dr. F. L. Kilborne, who was at the head of our experiment station at the time, into my office, and instructed him to place experiments for the subsequent year to test this question of ticks transmitting Texas fever. Acting on that positive instruction, Dr. Kilborne planned the experiments which demonstrated the pathogenic power of the tick in spreading the disease, and to Dr. Kilborne should be given the credit of carrying out these investigations."

It has given me added pleasure to have been the means of doing further justice, by evoking the above response from Dr. Campbell, to the memory of a really great veterinarian, Dr. D. E. Salmon, one of the first American veterinary graduates, and first Chief of the United States Bureau of Animal Industry, to whom the chief credit must now be given for having discovered first, not only the transmission of *Babesia bigemina* through the agency of the tick, *Margaropus annulatus*, but of vector transmission in any infectious disease.

Yours faithfully,
J. T. EDWARDS.

University of London Club,
21, Gower Street,
London, W.C.1.
April 9th, 1951.

BOWEL OEDEMA OF PIGS

Sir,—Dr. H. G. Lamont's most interesting talk at Grantham recently to the Lincolnshire Branch of the N.P.B.A. naturally included a reference to Timoney's work in Eire that bowel oedema in pigs is concerned with an entero-toxaemia.

I would like to suggest to veterinary practitioners that antibiotics, by mouth, are given a trial in the treatment of pig oedema. It is now clear from work at the Lederle Laboratories, U.S.A., that in aureomycin at least we have an agent which, given by mouth, exerts a potent effect on the intestinal flora. It reduces coliform and anaerobic bacteria markedly and appears to have its greatest effect on certain haemolytic toxin producing anaerobes. The following table shows these effects in chicks, and there is little doubt they would probably have similar results in pigs:—

Effect of Ingested Aureomycin on Intestinal Flora of Chicks

Micro-organism	Supplement None	Supplement Aureomycin
Coliform bacteria	57,000*	14,000
Anaerobic bacteria	15,000,000	100,000
Haemolytic anaerobes	15,000†	None

* Number of colonies developing on plates per mg. wet faeces.
† Number of large areas of haemolysis per gramme of wet faeces.

Although any of the recognised antibiotics (penicillin, streptomycin, aureomycin, terramycin, bacitracin and chloromycetin) may be used in this way, until aureomycin is available freely, it is probable that streptomycin would be particularly suitable because it is only slowly absorbed from the gut and should therefore exert maximum effect against the bacterial flora.

If the increased growth rate which we have obtained in chicks at Stoke Mandeville following the inclusion of antibiotics in their feed is proof of an effect on the bacteria of the intestines, then the dosage for pigs will not be great. I would suggest 10 to 40 mg. and if there is any difficulty in administration it can readily be mixed in a small feed.

This effect of antibiotics on the flora of the gut is surely indicative that in their use orally we have agents likely to prove of great value in the control of many types of intestinal infections in farm animals.

Yours faithfully,

The British Oil and Cake Mills, Ltd., W. P. Blount.
2, Kingscote Street,
London, E.C.4.

April 9th, 1951.

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"ANAVENOL": THE CARDIOLOGICAL ASPECT

Sir,—Mr. H. B. Parry's paper on "Anavenol" (*Vet. Rec.* **62.** 500), contains frequent references to "myocardial weakness" in the horse, this condition being nominated as one of the two contra-indications for the drug. He cites deaths from "sudden cardiac decompensation" in consequence, such an outcome being, he says, in line with his "experience of simple anaesthesia in horses." We find these remarks disquieting. It would seem that Mr. Parry recognises a cardiopathic condition in horses which, if not new, is all too little on record.

It had been our belief, in common with other observers, that organic heart disease in the horse was phenomenally rare. If the most serious of all the cardiopathies, *viz*, defect of the myocardium, is a significant clinical entity in horses in this country, as Mr. Parry imputes, it is surely a matter demanding the most searching enquiry. Above all is this the case for an animal fulfilling the horse's athletic rôle, and which is so frequently the subject of veterinary certification for soundness.

Enquiring further in Mr. Parry's paper into the question of diagnosis of the condition, we are not surprised to find that "it may not be obvious to casual inspection." But "animals with a poor myocardial reserve," we are told, "are readily detected by clinical observation of the cardiovascular system during the course of anaesthesia." By what specific signs is not made clear. The tricuspid regurgitation and jugular pulse which are described require "only slowing, or a brief pause, in the process of administration," and so are evidently not the criteria. The only sign specifically nominated is ventricular fibrillation ("Tachycardia may proceed in animals with a poor cardiac reserve, to ventricular fibrillation"). As ventricular fibrillation connotes sudden, certain death, we find this not very helpful. One is reminded of the primitive rite of ordeal by poison. Indeed the whole diagnostic procedure—administering a drug to the point of manifest cardiac distress or syncopic death—recalls ordeal by poison. Nor can we agree for a minute that "sudden cardiac decompensation" is a feature "in line with simple anaesthesia" in horses. Such a sequel is as phenomenal in our experience as myocardial weakness in the horse.

Elsewhere in his paper Mr. Parry observes:—"The cardiovascular signs are due to the immediate effect of the drug on the heart itself." Surely this is nearer the truth of the matter? And surely what might be styled "Parry's occult myocardiopathic syndrome" resolves itself properly into simple toxic action on the perfectly healthy equine heart which, in unfavourable circumstances and where there may be idiosyncrasy to the drug, can be broken down completely. It is Mr. Parry's own conception that "Anavenol" relaxes the atrio-ventricular ring to cause regurgitation. A perfectly healthy heart thus maltreated must suffer every serious disadvantage of a heart with peracute bilateral valvular incompetence, and if submitted to stress is accordingly bound to fail. Even to refer to this occurrence as "sudden cardiac decompensation" is incorrect. There is no question of compensated cardiac disease, and no question of decompensation arises.

We voice these criticisms reluctantly, but without option. Mr. Parry's enthusiasm seems to us to commit him to scientific indiscretions. He blames the equine heart for the misdemeanours of his drug. Any uninformed reader of his article would conclude inevitably that myocardial weakness is commonplace in horses and a normal cause of anaesthetic casualty. Both are imputations remote from the realities, and cannot be permitted to pass unchallenged. The reality is that cardio-toxicity as a side-effect is a serious disqualification of any alleged anaesthetic.

If we are mistaken, and Mr. Parry can adduce justification for his thesis, we beg him to do so if only for the unusual cardiological interest attaching.

Yours faithfully,

T. N. Gold.
E. O. Longley.

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THE ANIMALS (ANAESTHETICS) ACT, 1919

Sir,—I read with much interest the article by F. J. Milne, M.R.C.V.S., of Colorado, and I wish him to know that the restrictions and anomalies of the A.A.A. are appreciated by a large number of veterinary surgeons in this country.

The need to amend this Act was brought to the notice of the responsible body in 1942 and repeated reminders have been made since then. The invariable reply is to the effect that the present time is not opportune but that the matter will be kept in mind.

I believe that only when there is sufficient support and when sufficient pressure is brought to bear on the Ministry of Agriculture can we expect some satisfaction.

Following demonstrations of spinal and other nerve blocks at an N.V.M.A. meeting at Edinburgh and at the annual Congress at Cardiff, 1950, where considerable support was accorded my views on this Act, the following letter with pertinent correspondence was sent to the President of the N.V.M.A.

September 20th, 1950

The President of The National Veterinary Medical Association,
36, Gordon Square,
London, W.C.1.

Dear Sir,—I write to you regarding the matter which I endeavoured to broach at the A.G.M. of the N.V.M.A. at Cardiff, the Animals Anaesthetics Act.

I enclose pertinent correspondence to date.

I feel very strongly that the Act now serves no useful purpose and that it should be rescinded. Surely all that is required is that animals be effectively anaesthetised so that no unnecessary suffering is caused. I am satisfied that the members of the profession appreciate the value of anaesthesia and do not deny its use unnecessarily. I consider that it is a reflection on every veterinary school that at the end of five years' training the graduates are not free to select the anaesthetic they consider most suitable for the particular circumstances of each case they are required to treat. I know many instances where the class of anaesthetic specified by the Act is unsuitable, many where it is contra-indicated and cases where to conform with the Act would be fatal. In all these cases a satisfactory and effective alternative is available.

I know of no reason why this Act should continue to embarrass the members of our profession while the medical profession are required to endure no such restrictions.

Among my colleagues I find an ever increasing support for these views.

I would suggest that the subject be brought to the notice of the members by a short article in *The Veterinary Record* so that all

be given an opportunity to express their views and when the opinion of the members is known the council of the N.V.M.A. should act accordingly.

Yours truly,
JAMES SPREULL.

The following acknowledgment was received:

September 22nd, 1950.

Dr. J. S. A. Spreull, M.R.C.V.S.,
78, Ward Road,
Dundee.

Dear Dr. Spreull,—I am writing to acknowledge with thanks your letter on the subject of the Animals Anaesthetics Act, 1919, and the accompanying correspondence.

I will myself give careful consideration to this matter and see that it is brought before the appropriate committee of the Association at its next meeting.

Yours sincerely,
S. F. JOHN HODGMAN,
President.

Since then there has been evidence of whole-hearted support for rescission of the Act by members attending demonstrations at an N.V.M.A. meeting at Carlisle and at Glasgow.

I will be pleased to demonstrate the efficiency of nerve blocking as a method of anaesthesia to any body of veterinary surgeons in the hope that this most useful and efficient method will be more widely used and that further support in protest to the A.A.A. will be gained.

Yours faithfully,
JAMES SPREULL.

76/78, Ward Road, and 69, N. Tay Street,
Dundee.
April 3rd, 1951.

[The representations made by Dr. Spreull in his letter to the President were referred to a sub-committee of the Parliamentary and Public Relations Committee of the Association, and the report of this sub-committee was presented to Council at its meeting on April 18th.—*Editor*.]

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VOLATILE ANAESTHETICS

Sir,—While agreeing with Mr. Menon that ethyl-chloride is a useful short-acting anaesthetic in the cat, I feel that he must have been very unfortunate in his use of ether and chloroform.

I find that with these anaesthetics the use of a perforated tin has advantages over more complicated methods.

Of a consecutive series of 300 cats and kittens spayed under ether chloroform there was one anaesthetic death and five cases of partial asphyxia, all of which responded to artificial respiration and/or a drop of Scheele's acid on base of tongue.

In hysterotomies where some of the subjects were in a toxic condition the mortality was 2·5 per cent.

Yours faithfully,
13, Australia Road, OLWEN D. JAMES.
Gabalfa,
Cardiff.
April 12th, 1951.

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BREAKDOWN IN STUDENTS

Sir,—I am not normally given to writing to the Press, professional or otherwise, but a matter raised in your issue of April 7th prompts me to do so.

Your quotation from the *Lancet* of Dr. Parnell's views on nervous and other disorders in students brings up a point which has long required airing, and it is a pity that it was seen fit to make them the butt of a sarcastic editorial comment which was apparently intended to be humorously derogatory.

I am not suggesting that it is common for the condition to be so pronounced that a student loses a whole term's residence, although several such cases occurred among my contemporaries at College, but a milder form, with varying symptoms of nervous disorder, was frequently seen. I had it, and was treated by my doctor for it, and one of my friends had it a good deal more severely. Other mild cases often recovered spontaneously during the vacations.

That the condition should, except in severe cases, go undetected is natural, as students, and particularly veterinary students, would obviously be very loath to admit that they were not holding their own, while College Authorities would wish to belittle it for other reasons.

That a student, battling his way through one of our colleges, without help or encouragement, and often with very little idea of what is required of him, knowing only that if his number is missing from a little notice on a lab. door his whole career is doomed, should get some such disorder to a greater or lesser degree, is surely only reasonable, and Dr. Parnell is right to regard it as a serious occupational disease.

I would venture to suggest, Sir, that to treat the matter as one suitable for unseemly jest or with an implied sneer at the unfortunate patients, is not worthy of our professional Press.

Yours faithfully,
25, Icen Way, W. MICHAEL SALMON.
Dorchester.
April 8th, 1951.

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Sir,—I feel that the Editorial comment on page 260 of *The Veterinary Record* of April 7th—that which is appended to the note on "Breakdown in Students"—should not be allowed to pass without some protest.

As one who has been a student both at the Royal Veterinary College, Camden Town, and in the University of Cambridge, and who is now carrying out research and teaching in the University, may I say that the majority of the University students with whom I have come into contact are remarkably free from signs of "nervous debility." It is true that there are some who cannot stand up to the strain imposed upon them by the University régime, but before they are cast aside as weaklings it must be realised that the strain to which they are subjected is very severe indeed. It is difficult to put a name to all the causes which contribute to the building up of this pressure, but there is no doubt that the extreme shortness of the University term, and subsequent compression of courses, the size and diversity of activities and interests of the student body, and the system of class lists in the publication of examination results are very important factors. I can assure readers that the difference between the strain involved in the University examinations, with one's results published as first, second or third class, and the examinations of the Royal College of Veterinary Surgeons, where the emphasis is upon a simple "pass or fail" result, has to be suffered to be fully appreciated. In illustration of this point, there have recently been cases of students who undertook the whole of the veterinary course with ease and even with distinction, but whose health broke down under the tension of a University course.

It is very difficult to attempt to differentiate between groups of students and to say that one group is "made of sterner stuff" than the others. It will also be very difficult for those of us who are endeavouring to "infuse veterinary blood into the universities" to maintain good relations with the universities in the face of such provocative and superior statements from leaders in our profession.

Yours faithfully,
Newnham College, Cambridge. MARY C. LOBBAN.
April 12th, 1951.

Conditions Governing Acceptance of Display Advertisements in "The Veterinary Record"

1. The Association cannot be regarded as approving the subject matter of any advertisements; nor is it a function of the Association to test the validity of advertised matter other than as outlined below.

2. The Association reserves the right to refuse publication of any advertisement without disclosing reasons to the advertisers.

3. Supply of prophylactic or therapeutic agents for veterinary purposes direct to the lay public may be regarded as adequate reason for refusing publication of any or all advertisements submitted by the firm concerned.

4. The general nature of prophylactic or therapeutic agents should be stated as part of the advertisement.

5. If any specific claims are made by the advertiser in relation to any product, they should be stated, briefly, or at length, as part of the advertisement and should be in reasonable accord with claims published elsewhere or commonly associated with the product.

6. In the case of new products, any claims of an unusual or important nature should be supported by positive evidence that the product is worthy of extensive field use.

7. If adequate evidence becomes available which indicates that claims made in respect of an advertised product are ill-founded, misleading or extravagant, reasonable notice will be given to the advertiser either to terminate publication in *The Veterinary Record* or to amend the wording of any claim made therein and elsewhere to the satisfaction of the Association.

8. "Copy" for all advertisements to be submitted for acceptance well in advance of publication (Press day: Wednesday), to the Editor, *The Veterinary Record*, 36, Gordon Square, W.C.1.